GCC LaserPro

X500III

User Manual

Dear Madam and Sir,

Thank you for choosing GCC and the LaserPro X-Series. You can be assured that this machine meets all of the highest safety standards while using technological innovations shared by no other laser engraver. The LaserPro X500 SERIES is backed by GCC, a truly international company that is dedicated to help your business grow.

We at GCC are proud to introduce the LaserPro X500 SERIES, our most technologically advanced laser engraver to date. This easy to operate machine has been designed with quality, productivity, and safety in mind. With innovations like the QSM^{TM}, stellar quality under high speed and SmartFILE file management, the LaserPro X500 SERIES is clearly on the cutting edge of all laser systems.

GCC understands that a creative technical background is the key to successful growth in the ever-changing information economy. We have a strong team of R&D experts who propel our company to new heights. From product development to manufacturing, our engineers are dedicated to innovation and quality.

Guiding our solid technical base is a world-class management team. At GCC, our leaders bring together marketing, technical support, research development and distribution experts to create an international network able to meet your demands. Over the years, this network has been able to span the globe. Our technical support staff is committed to provide you with impeccable service, and when your business is ready to grow, our team will also be there!

Sincerely,

Leonard Shih
President of G.C.C.

Content

Chapter I – Safety

1.1 Principles of a CO2 Laser

LASER is the acronym for Light Amplification by Stimulated Emission of Radiation. A CO_2 laser works by electrically stimulating the molecules within a carbon dioxide gas mixture. When focused through a lens, this highly-intense, invisible beam will vaporize many materials. Depending on the speed and intensity of the projected beam, a CO_2 laser may be used to engrave or cut through a wide variety of materials.

1.2 Safety Ratings

The LaserPro X500 SERIES is equipped with a sealed carbon-dioxide laser that emits intense and invisible laser radiation with a wavelength of 10.6 microns in the infrared spectrum. The laser system is designated as a Class I laser device, meaning that the system is equipped with key safety features and an enclosed lens carriage to completely contain the laser under standard use. One of the key safety features found on the LaserPro X500 SERIES is a Class 2 red dot safety guidance pointer compliance with CDRH safety requirement (similar to a laser-pointer presentation pen), allowing the operator to see the exact location where the laser beam will fire. Even though the LaserPro X500 SERIES is equipped with our most powerful laser to date, proper usage and hardware safeguards make it an extremely safe machine. When the front door and back door are open, machine becomes a Class 4 equipment and users must wear goggles to operate the machine.

1.3 The Safety Interlock System

The laser system is equipped with a safety interlock system utilizing magnetic sensors on the top and side access doors, laser-activation and door LED lights on the control panel. The magnetic sensors will deactivate the laser when either door is opened. At this time, the "door" LED light found on the control panel will illuminate, indicating an open or improperly closed door. When the laser is in operation, the "laser" LED will illuminate to inform the operator that the laser is activated. If at any time, any of the access doors are open and the "laser" LED is illuminated, **IMMEDIATELY** un-plug the laser system and contact GCC technical support for service instructions.

> ⚠️ *WARNING*
> - **DO NOT** operate the laser system if any component of the safety system is malfunctioning.
> - **DO NOT** attempt to remove or modify any component of the safety interlock system.

1.4 Safety Labels

According to CDRH standards, all fixed or removable covers that allow access to a laser beam must have the appropriate laser warning labels attached to them. These warning labels must be clearly visible to the operator prior to removing the cover. Additional labels must be applied to the interior of the machine and be visible in the event when the covers are removed. A label clearly displaying the manufacturer's name, date of manufacture, description of product, model number, serial number, and compliance statement must be attached to the outer surface of the machine.

In compliance with CDRH standards, the required warning labels are affixed at the time of manufacture to the LaserPro X500 SERIES in the appropriate locations. These labels are not to be modified in any way or removed for any reason. Please familiarize yourself with the specific labels and their locations on the machine. Below is a list of all the safety labels and their locations on the machine.

232001260G(12)

Product Label

This label is located at the right-back side of machine. All the product information such as Serial Number, Model Numbers, Laser Power and Electric power can be found here. Before requiring any tech support, always provide the service person with the information on this label.

GCC *LaserPro*	**Serial Number** **I50357**

Manufacturer	Great Computer Corporation
Product	Laser Engraver
Model	X500III
Model Number	X500III-80
Wavelength	10.57-10.63μm
Power	CO_2 80W
Input	200-240VAC, 50-60Hz, Max 10A
Manufactured	May 2012

Class I Laser Product Complies with EN60825-1:2007
Class II Laser Product Complies with CDRH
Designed by GCC in Taiwan Assembled in China
No.1,Chen Feng Road, Yushan, Kunshan, Jiangsu, China

GCC *LaserPro*	**Serial Number** **I50357**

Manufacturer	Great Computer Corporation
Product	Laser Engraver
Model	X500III
Model Number	X500III-80Y
Wavelength	10.57-10.63μm
Power	CO_2 80W
Input	200-240VAC, 50-60Hz, Max 10A
Manufactured	May 2012

Class I Laser Product Complies with EN60825-1:2007
Class II Laser Product Complies with CDRH
Designed by GCC in Taiwan Assembled in China
No.1,Chen Feng Road, Yushan, Kunshan, Jiangsu, China

232001260G(12)

	Serial Number I50357
GCC *LaserPro*	
Manufacturer	Great Computer Corporation
Product	Laser Engraver
Model	X500III
Model Number	X500III-100
Wavelength	10.57-10.63 µm
Power	CO_2 100W
Input	200-240VAC, 50-60Hz, Max 10A
Manufactured	May 2012

Class I Laser Product Complies with EN60825-1:2007
Class II Laser Product Complies with CDRH
Designed by GCC in Taiwan Assembled in China
No.1,Chen Feng Road, Yushan, Kunshan, Jiangsu, China

CE

	Serial Number I50357
GCC *LaserPro*	
Manufacturer	Great Computer Corporation
Product	Laser Engraver
Model	X500III
Model Number	X500III-100Y
Wavelength	10.57-10.63 µm
Power	CO_2 100W
Input	200-240VAC, 50-60Hz, Max 10A
Manufactured	May 2012

Class I Laser Product Complies with EN60825-1:2007
Class II Laser Product Complies with CDRH
Designed by GCC in Taiwan Assembled in China
No.1,Chen Feng Road, Yushan, Kunshan, Jiangsu, China

CE

	Serial Number I50357
GCC *LaserPro*	
Manufacturer	Great Computer Corporation
Product	Laser Engraver
Model	X500III
Model Number	X500III-130
Wavelength	10.57-10.63 µm
Power	CO_2 130W
Input	200-240VAC, 50-60Hz, Max 10A
Manufactured	May 2012

Class I Laser Product Complies with EN60825-1:2007
Class II Laser Product Complies with CDRH
Designed by GCC in Taiwan Assembled in China
No.1,Chen Feng Road, Yushan, Kunshan, Jiangsu, China

CE

232001260G(12)

	Serial Number
GCC *LaserPro*	**I50357**
Manufacturer	Great Computer Corporation
Product	Laser Engraver
Model	X500III
Model Number	X500III-130Y
Wavelength	10.57-10.63 µm
Power	CO_2 130W
Input	200-240VAC, 50-60Hz, Max 10A
Manufactured	May 2012

Class I Laser Product Complies with EN60825-1:2007
Class II Laser Product Complies with CDRH
Designed by GCC in Taiwan Assembled in China
No.1,Chen Feng Road, Yushan, Kunshan, Jiangsu, China

232001260G(12)

GCC LaserPro	Serial Number 150357
Manufacturer	Great Computer Corporation
Product	Laser Engraver
Model	X500III
Model Number	X500III-150
Wavelength	10.57-10.63 µm
Power	CO_2 150W
Input	200-240VAC, 50-60Hz, Max 10A
Manufactured	May 2012

Class I Laser Product Complies with EN60825-1:2007
Class II Laser Product Complies with CDRH
Designed by GCC in Taiwan Assembled in China
No.1,Chen Feng Road, Yushan, Kunshan, Jiangsu, China

GCC LaserPro	Serial Number 150357
Manufacturer	Great Computer Corporation
Product	Laser Engraver
Model	X500III
Model Number	X500III-150Y
Wavelength	10.57-10.63 µm
Power	CO_2 150W
Input	200-240VAC, 50-60Hz, Max 10A
Manufactured	May 2012

Class I Laser Product Complies with EN60825-1:2007
Class II Laser Product Complies with CDRH
Designed by GCC in Taiwan Assembled in China
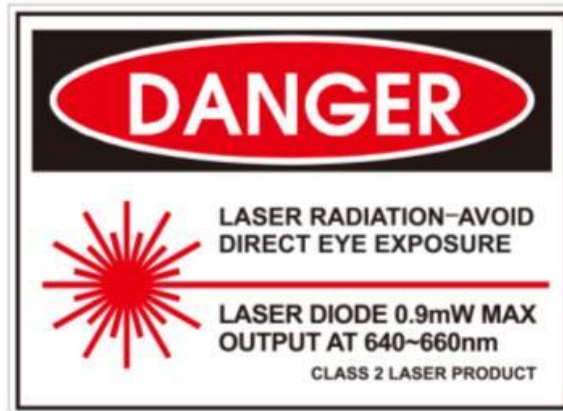No.1,Chen Feng Road, Yushan, Kunshan, Jiangsu, China

CDRH Label

This label indicates the class level of CDRH.

DANGER

LASER RADIATION−AVOID DIRECT EYE EXPOSURE

LASER DIODE 0.9mW MAX OUTPUT AT 640~660nm

CLASS 2 LASER PRODUCT

Laser Path Warning Label

LaserPro machines are very safe under normal functioning conditions. However, in case of any accident, Laser Path Warning Label will be affixed on the possible laser path. When operators are near by these paths should be careful of possible injury while machine is working.

CAUTION
AVOID PLACING YOUR EYES IN
THE RED BEAM PATH

Emergency Stop Label

This label indicates the emergency stop button. You can find this label on the right upper side of the machine.

Emergency Stop Emergency Stop

Door open warning labels

CAUTION
CLASS 4 VISIBLE AND INVISIBLE
LASER RADIATION WHEN OPEN
AVOID EYE OR SKIN EXPOSURE
TO DIRECT OR SCATTERED
RADIATION
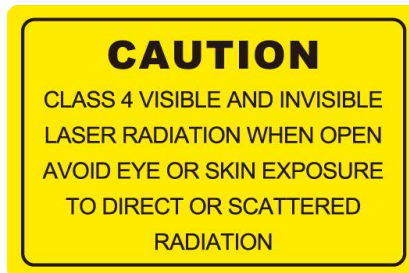
Aperture warning stickers:

This label indicates the laser path. Normally you can find this label inside of machine or laser exit. Please take extra caution of this area when you conduct maintenance or operate machine.

AVOID EXPOSURE -
VISIBLE AND INVISIBLE
LASER RADIATION IS
EMITTED FROM THIS
APERTURE

Protection Window Label

This label indicates the protection wavelength. You can find this label in the lower right corner of window.
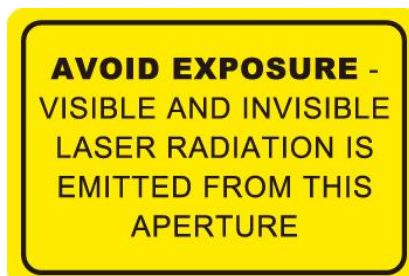

Warning Label

Warning Label is written with all the necessary information to be aware of in every operation.

1.5 Safety Measures

- **LASER RADIATION WARNING:** Exposure to laser radiation may result in physical burns and severe eye damage. Proper use and regular maintenance of this machine is important to the safety of all people in the immediate area.
- Prior to operation, carefully read and familiarize yourself with the warning labels located on both your laser system and in this manual.
- Never leave the machine unattended during the laser cutting process. The laser may ignite combustible materials. A well-maintained fire extinguisher and operational smoke or fire detector should be kept in the vicinity of the machine.

- **Resulting debris from laser cutting are very dangerous and may cause fire hazard**
- **DO NOT leave debris and scraps inside laser machine after job finished. Must keep machine clean after job finished.**

- **Caution—Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.**

-

> ### ℹ *NOTE*
> SmartGUARD™ is an optional fire detection alarm system developed by GCC. Contact your local GCC authorized distributor for more details to have this safety option installed onto your system.

- Enable the optional SmartAIR™ nozzle when engraving or cutting materials that may easily ignite, such as acrylic, wood, or paper.

> ### ℹ *NOTE*
> Each LaserPro laser machine is shipped with a single pair of safety goggles. If additional safety goggles are required, please contact GCC directly or an authorized GCC distributor. If you wish to purchase one on your own, please make sure the safety goggles meet these requirements:
>
> 190 - 398 nm OD5+
> 10600 nm OD5+
> Visible Light Transmission: 92.9%

- Connect the machine to a properly grounded power outlet. Ensure the voltage of the power source is identical to the voltage of the machine.
- Do not open the laser access panel when the machine is plugged in.
- Do not attempt to modify or disassemble the laser module.
- Do not attempt to remove or modify any component of the machine's laser interlock safety system.
- Ensure the immediate work area of the machine is well-ventilated. Odors, vapors, and dust are byproducts generated during the laser cutting process. An exhaust system, vacuum cutting box, and honeycomb table are recommended. Please contact GCC or your local GCC distributor for more information.
- Do not laser heat-sensitive surfaces or materials that may generate toxic fumes, such as PVC and Teflon.
- Regularly clean and maintain your machine according to our cleaning and maintenance instructions.
- Doing so will ensure your machine will operate effectively and safely over a long period of time.

1.6 Operating Environment

Please follow the guidelines when considering a suitable location to set the LaserPro X500 SERIES. Improper work environment may lead to operational malfunction and/or unsafe working conditions. The LaserPro X500 SERIES should be placed and operated in a standard office-type environment.

- Avoid environments where the machine is exposed to high levels of dust, temperature (temperatures exceeding 30°C or 86°F) or humidity (humidity exceeding 70% or where the ambient temperature is near the dew point).
- Avoid small, enclosed areas with poor ventilation.
- Avoid areas with high levels of noise and electrical noise.
- Select a location that is large enough to accommodate the LaserPro X500 SERIES, an exhaust system, a water chiller, a computer and a work or storage table.

- Select a location in which the ambient temperature remains between 15°C and 30°C (60°F to 86°F).
- Select a location in which the relative humidity remains between 30% - 40%.
- Select a location in which there is a short, direct path to a fume exhaust system.
- Set the LaserPro X500 SERIES on a floor surface that is completely even.
- Make sure your smoke or fire detection system in the immediate area is functioning.
- Setup the machine to be apart from the wall for at least 60 cm (2 feet).

232001260G(12)

Chapter II - Unpacking & Contents

2.1 Unloading and Unpacking

The LaserPro X500 SERIES is shipped in one crate that contains the machine, the software, and all of the necessary accessories.The following section contains detailed step-by-step instructions for unpacking and assembly of the machine.

> ⚠ **WARNING**
> **To prevent personal injury or damage to the machine, please obtain assistance when loading and unloading the shipping crate.**

> ⓘ **NOTE**
> **Please save the original shipping crate. If the machine must be returned for product servicing, it will need to be packed in its original shipping crate. The machine is heavy. To prevent damage to the machine or injury to personnel, please get assistance. Do not try to lift the equipment alone.**

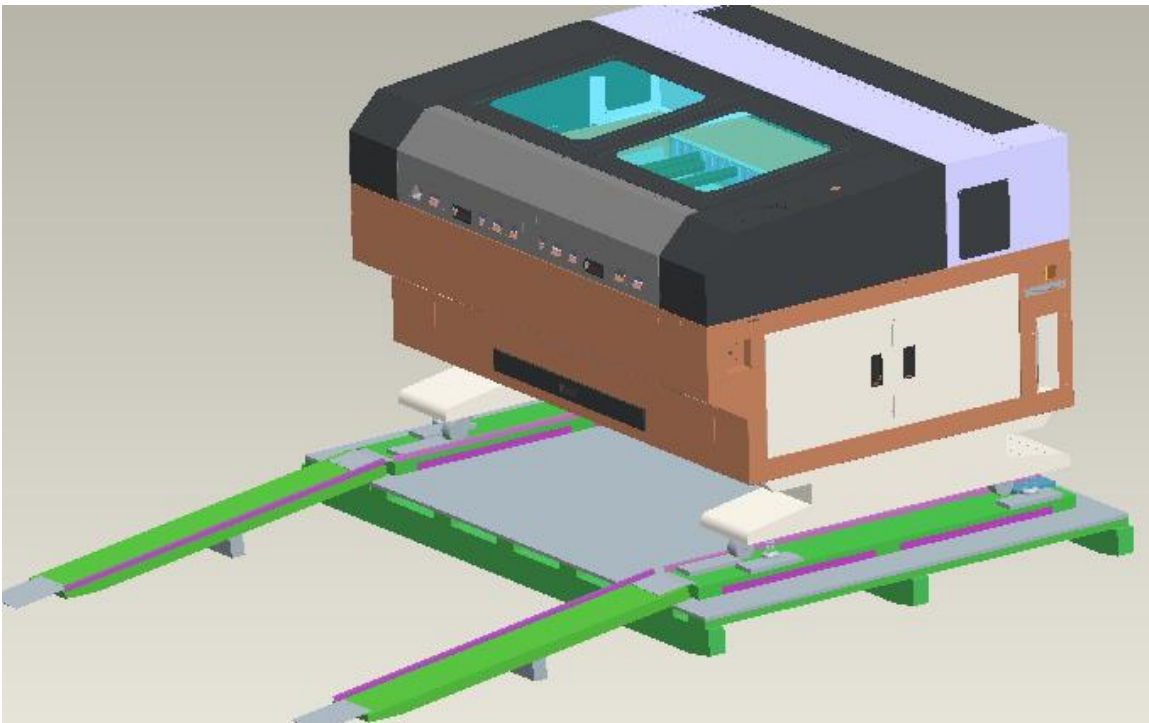Perform the following steps to unpack your machine.

Step 1   Use an M12 open end or impact wrench to unscrew and remove the top.

Step 2   Remove the 4 sides of the crate one by one.

Step 3   Take the protective wrap off the machine.

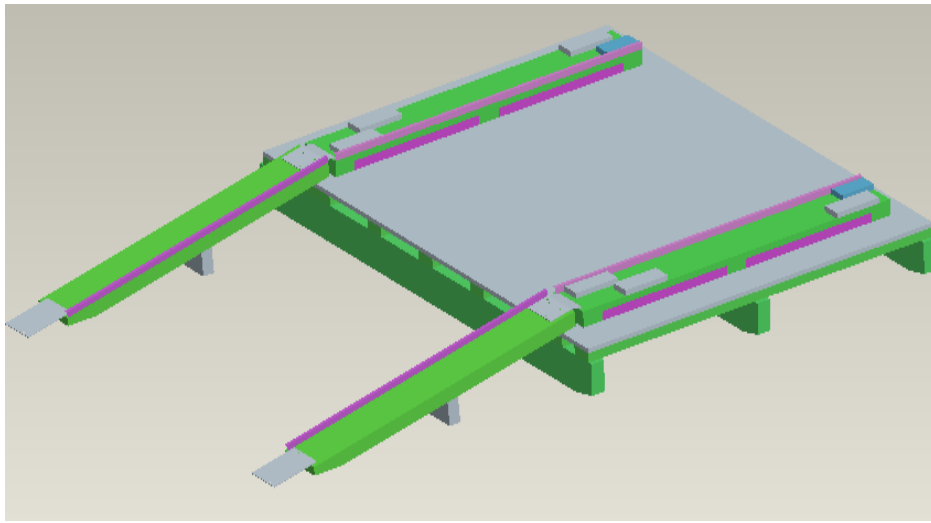Step 4   Take out the wooden holding stick

Step 5   Loosen and remove the pink packing strips by pushing the lock on the strip down, and then pull it out towards the top before you can loosen the strips.

Step 6   Unscrew the two step boards, take them out of the crate, and then turn them upside down.

Step 7   Put the step boards at one side of the crate base to form a slope.

Step 8 Remove the wooden block from the crate base, and then unscrew the four holding stands so that they can be moved up.
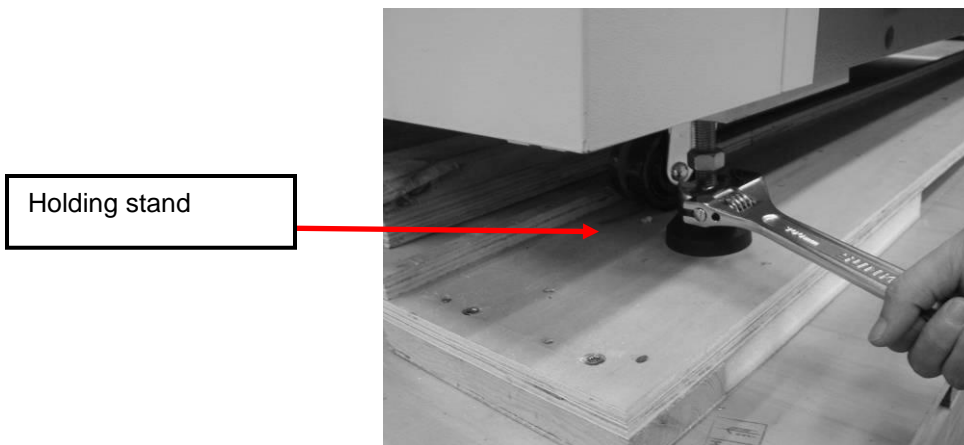
Holding stand

Step 9 Roll the machine out of the crate base to where you are going to setup.

Step 10 Remove the X-axis restraining strips.

Step 11 Screw 4 holding stand on the ground and adjust the level.

Step 12 Save the crate for shipping in the future.

2.2 Contents and Accessories Checklist

Please check to ensure that all of the following items are included within the shipping crate. If any of the following items are missing, immediately contact your local GCC distributor.

Item	Quantity
Main Power Cord *Power installation requires a certified electrical technician.	1
USB Cable	1
Ethernet Cable	1
Safety Goggles	1
Lens Cleaner	1
Cotton Swabs	1
Focusing Tool	1
Lens Cleaning Paper	1
Cutting Table Supporting Bars	15
Quality Promise Card	1
User's Guide Disk (Driver included)	1
QuickALIGN Switch	1
Key for Laser Firing Control	2
Hose Clamp 8 1/2"	4
Water Chiller Tubing - 7M (Diameter:1/2 inch)	1
Focal Lens Removal Tool	1

Chapter III - Mechanical Overview
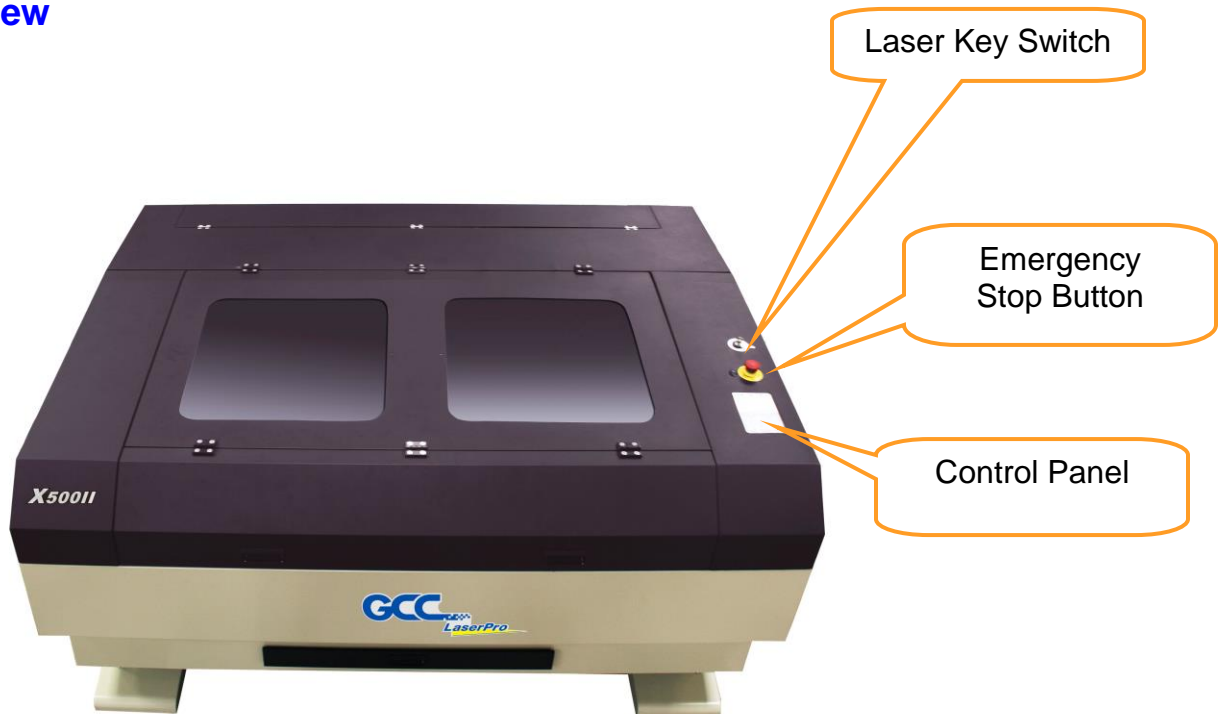
Please take some time to familiarize yourself with this section regarding the mechanical overview of the LaserPro X500 SERIES. References will be made back to the different parts of the LaserPro X500 SERIES in later sections.

3.1 Front View

3.2 Top View

3.3 Right (Profile) View

Main Board Module

Power outlet

Data Interface

3.4 Left (Profile) View

Access Panel Mirror #1

3.5 Rear View

Laser Tube Module

SmartEXT™ Pass-Through Door (Rear)

Exhaust Hose Connector

Air Assist Valve

Chapter IV - Setup and Installation

4.1 Machine Setup
4.1.1 Powering Up the Machine

> ⚠️ **CAUTION**
> Make sure both the LaserPro X500SERIES and computer are turned off before connecting either to a power source.

1) Connect the power cord to a quality surge protector and then connect the surge protector to a properly grounded outlet.
   Do the same for the computer system.
2) Connect the power cord in the machine's power cable inlet located on the right side of the machine

> ℹ️ **NOTE**
> • Make sure to supply 200-240V of electricity to the LaserPro X500 SERIES

4.1.2 Power Cable Connection

Power Outlet and Connectors

4.1.3 Hose Connector

Powerful down vacuum will increase the cutting edge quality, and the suction design on the lens carriage helps to remove the dust and exhaust generated on material surface when doing laser engraving tasks. GCC LaserPro X500 SERIES default sets two 8" hose connectors on the middle-rear side. We recommend connect fume extraction system with air flow capacity equivalent or more powerful than 2160CMH (m^3/h) or 76291CFH(ft^3/h).

INSTALLATION

1) X500 SERIES default setup two 8" exhaust ports on the middle-rear of the machine.
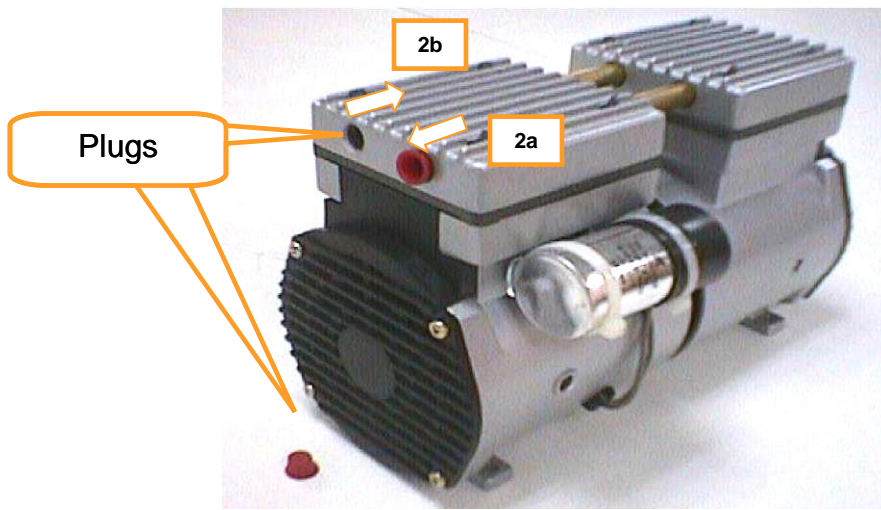
4.1.4 Air Compressor

Specifically designed for laser engravers, the air compressor utilizes an oil-free safeguard. The air compressor helps eliminate harmful and potentially damaging moisture from the laser optics, maximizing laser optic life. In addition the air compressor provides the optimal air flow to the SmartAIR nozzles to minimize flaming, suppress working temperatures, and blow away dust and particle byproducts generated from the laser process.

¼" Air Inlet Tube

Power Cord B

Power Cord A

INSTALLATION

1) Remove the plugs on the air compressor to expose the air inlets.

2) Fasten the included air tube fastener valve to the outgoing air inlet (indicated by 2a) and the air filter into the ingoing air inlet (indicated by 2b).
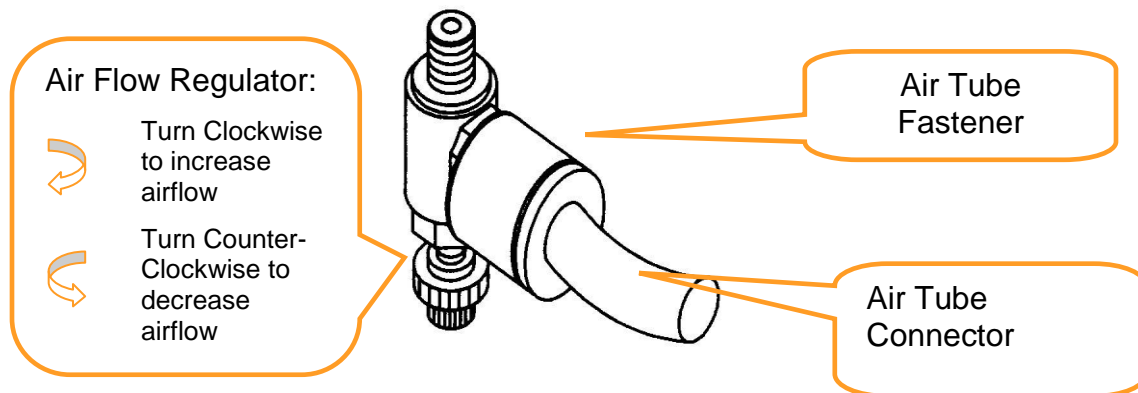
3) Connect a ¼" tubing to the air tube fastener valve on the air compressor.

> *i* **NOTE**
> It is important that the ¼" air tubing has clean, straight cuts on each end. Jagged or slanted cuts will not produce adequate sealing capabilities.

4) On the right-rear side of X500 SERIES to locate both the Air-Assist Valve and Internal Power Sockets, as indicated below:

5) Plug the air compressor's power cord A into the AC power socket.

6) Plug the male end of power cord B to the AC power socket and the female end to an external power outlet on laser system.

7) Take the unattached end of the ¼" air tubing (other end already connected to air compressor) and connect it to the air tube connector on the air assist valve. Make sure you press down on the air tube fastener when inserting the ¼" air tubing, to form a tight, secure attachment as indicated in the diagram below.

Air Flow Regulator:

Turn Clockwise to increase airflow

Turn Counter-Clockwise to decrease airflow

Air Tube Fastener

Air Tube Connector

8) Congratulations, you have finished setting up the air compressor.

OPERATION

1) Switch on the air compressor unit and make sure that the airflow regulator on the air assist valve is opened (turn clockwise to increase the airflow, counter-clockwise to decrease the airflow). The air nozzle under the lens carriage should emit a steady flow of air.

2) With the SmartAIR nozzle and air compressor properly installed and operating, all configurations and settings relating to air-assist functions are controlled through the LaserPro X500 SERIES print driver and hardware control panel. Please refer to the LaserPro X500 SERIES PEN page on print driver and graphic control panel sections of this manual for details on how to enable and configure air-assist functionalities.

4.1.5 Water Chiller Installation

The water cooler that will be connected to the machine consists of a cooling system, and two water tubes that allow inflow and outflow of water. When you turn the power on, the cooling system is activated and delivers cool water to the laser tube module to absorb the heat generated there, and then brings it back to the cooling system to cool down.

Please read the user manual comes along with the water chiller before setup and operation.

> ℹ️ **NOTE**
> Be sure to power on your water chiller before starting to operate LaserPro X500 SERIES. Water chiller temperature is recommended to be set to 25℃. The laser will not fire if the water chiller is not turned on. To solve this problem, just power on water chiller then restart the LaserPro X500 SERIES.

The water chiller is an external device that has to be connected to the laser machine for cooling down the laser tube. For water chiller setup and adding water, please refer to the water chiller manual on the device. Here we will show you some basic tubing connection, follow the steps to connect the water chiller with laser system.

> ℹ️ **NOTE**
> 1. Water chiller setups need to be handled by professional technician. End users cannot process by themselves.
> 2. It is recommended to change the cooling water every month.
> 3. Remove water from the water chiller if machine will not be operated for an extended period of time.
> 4. If you need to ship the laser machine after using it, you must remove the water tubes that are connected beneath the laser machine, and then lift these two tubes up as high as possible so that the cooling water will not drain out.
> 5. Do not disconnect the water tubes too often, in case they become loose.
> 6. Do not spill any water onto the internal components of laser machine while removing the water tubes.

> ℹ️ **NOTE**
>
> The coolant used with the water chiller should have the following properties:
> - Good heat conduction and low viscosity
> - Anti-dirt forming
> - Low electric conductivity
> - Non-corrosive
>
> De-ionized or distilled water are recommended as the coolant. Propylene glycol is recommended as the coolant when used with an anti-freeze agent.

Step 1. Please connect the water pipe of the water chiller to the water inlet and outlet connector on the laser engravers.
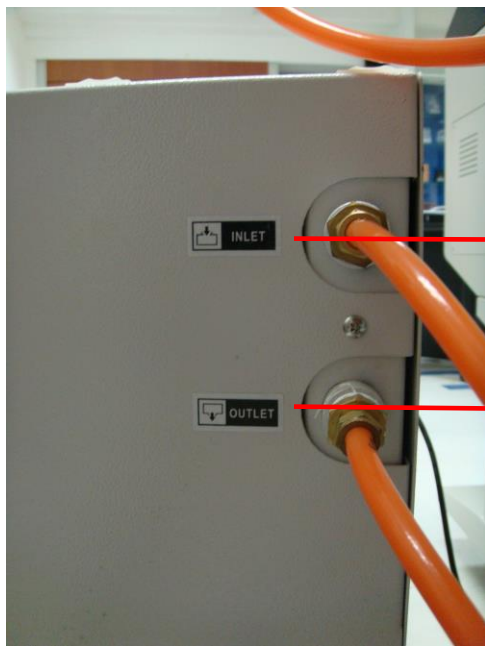
The inlet tubing of chiller should be connected to the outlet connector on the laser machine.

The outlet tubing of chiller should be connected to the inlet connector on the laser machine.

Step 2. Arrange the Outlet and Inlet tubing as follows. Insert the outlet tubing of chiller through the "Water in" slot opening.

Step 3. Connect the outlet tubing from chiller to the "Water in" connector on machine.
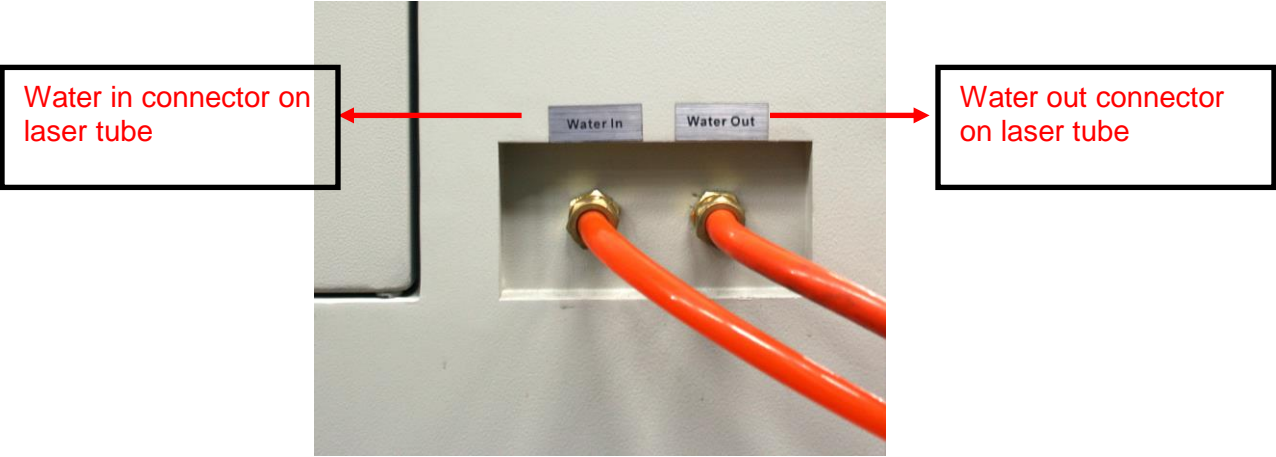
Water in connector on laser tube

Water out connector on laser tube

4.1.6 Adjustable Air Nozzle

The Air nozzle can be adjusted to create different distances to the working piece for different air blowing effect to meet various application demands and prevent dust accumulating on the lens.

NOZZLE ADJUSTMENT:
1) **Clockwise**
   Nozzle moves closer to the material surface to have a direct and stronger air blowing force on the material.
2) **Counter-clockwise**
   Nozzle moves away from the material surface to for a weaker air blowing force on the material..
3) **Remove Nozzle**
   If you do not need a strong air blow direct on the material, screw nozzle counter-clockwise to remove it and have an open air blow.
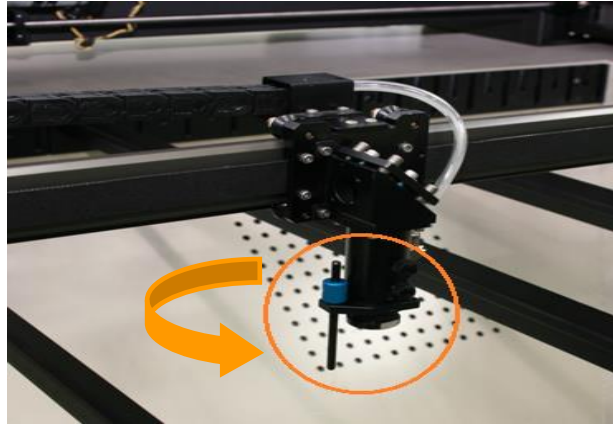
4.1.7 Knife-shaped Cutting Table

Unique cutting table with tipped bars that can be easily adjusted without tools to create different levels of working depths. The cutting table of X500 SERIES reduces laser reflections and delivers clear cutting edge.

> 1)   3 levels of supporting slots design on cutting table for cutting bars.

2) Place more Supporting Cutting Bars for better support.

4.1.8 Supporting Pin Kit

Cutting job without the Supporting Pin Kit may have laser reflections to damage your art work while powerful laser hit the supporting table or the art work that cuts off may fall down and being damaged.


4.1.9 Manual Focusing Tool

Before processing a job, we need to make sure the focus distance is set correctly. For this purpose, a focus tool is made available in the accessory box. Using the focusing tool can help you to adjust the appropriate focusing distance. User can make sure that the focal distance is set correctly.

The focus distance can be adjusted by adjusting the position of the Knife-shaped Cutting Table (to cover bigger distances) or by adjusting the lens carriage (for shorter distances):

1. Adjust Knife-shaped Cutting Table. There are different levels of depths for Knife-shaped Cutting Table to help you adjust focusing distance.

2. As for shorter adjustments, user can adjust the tube distance by rotating the shaft of lens carriage to slide the carriage up and down to fit the focal distance.
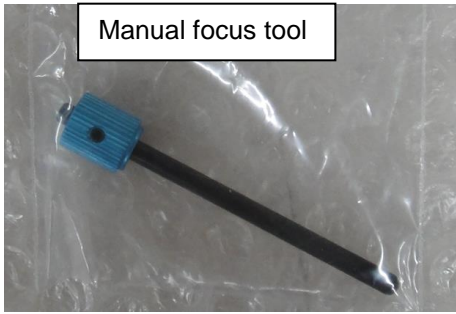
Manual focus tool

Insert the manual focus tool to the slot on the lens carriage as red arrow indicated.

Rotate the shaft to release the lens carriage and move the air nozzle up and down to fine tune the focal distance till the tip of focus tool just touches the surface of work media. The optimal focus distance plays one of the key role of cutting result.

4.1.10 Connecting the Computer

The LaserPro X500 Series can communicate with a computer through a USB Port or LAN Port connection interface. Regardless of the connection method chosen, you will need to connect the respective connection cable from the LaserPro X500 Series to your computer.

USB Connectivity: Connect the included USB Port Cable to the USB Port on the right side of the LaserPro X500 SERIES.

Ethernet Connectivity: Connect the Ethernet Cable in accessory to the Ethernet port on the right-hand side of the laser system. Follow below instruction for Ethernet connectivity setup.

> ### ⓘ *NOTE*
>
> 1. Never leave laser system unattended during laser cutting, engraving, and marking process, even with Ethernet or Wi-Fi connection setup, this requirement cannot be avoided. Exposure to the laser beam may cause ignition flame to combustible materials.
>
> 2. DO NOT connect USB cable to laser machine when going to use Ethernet cable as data transmission.
>
> 3. If you have purchased additional Optional Accessories for the LaserPro X500 SERIES, please refer to chapter VII for instructions on how to properly setup your optional accessories. These should be setup prior to working with your LaserPro X500 SERIES.

4.1.10.1 Networking Connectivity Setup

GCC laser engraver is built-in with LAN port to enable multiple laser engravers to be operated by one PC and multiple PCs to share a single unit of laser engraver. Follow the setup instructions below using GCC Spirit GLS machine as illustration.
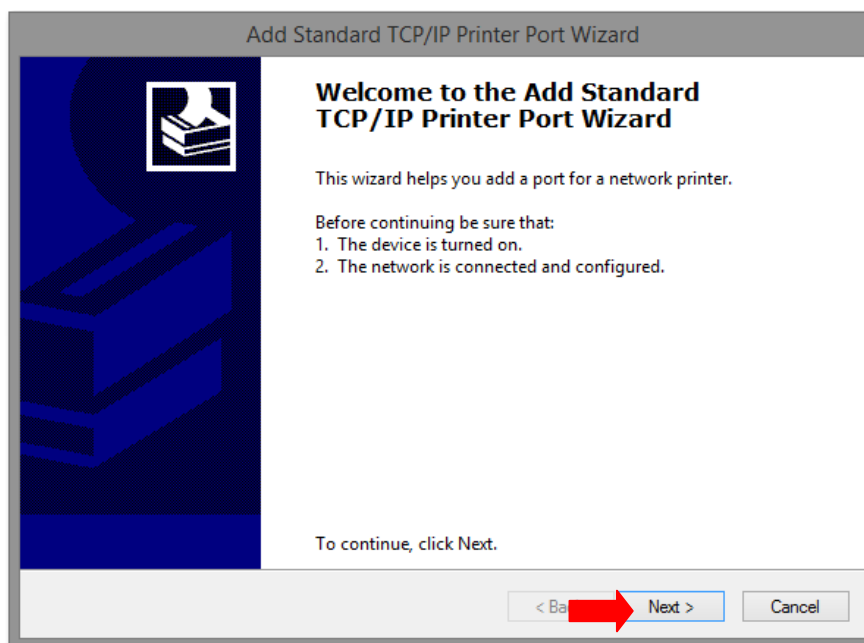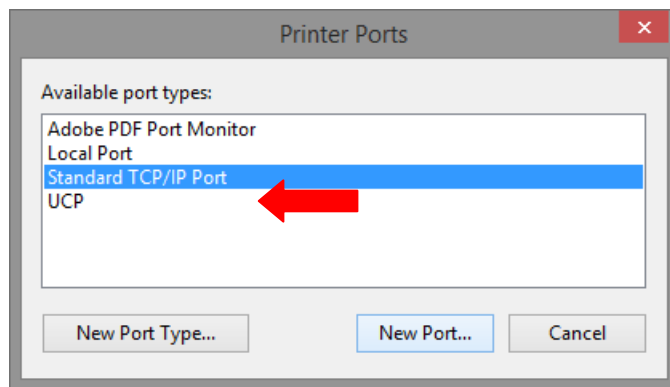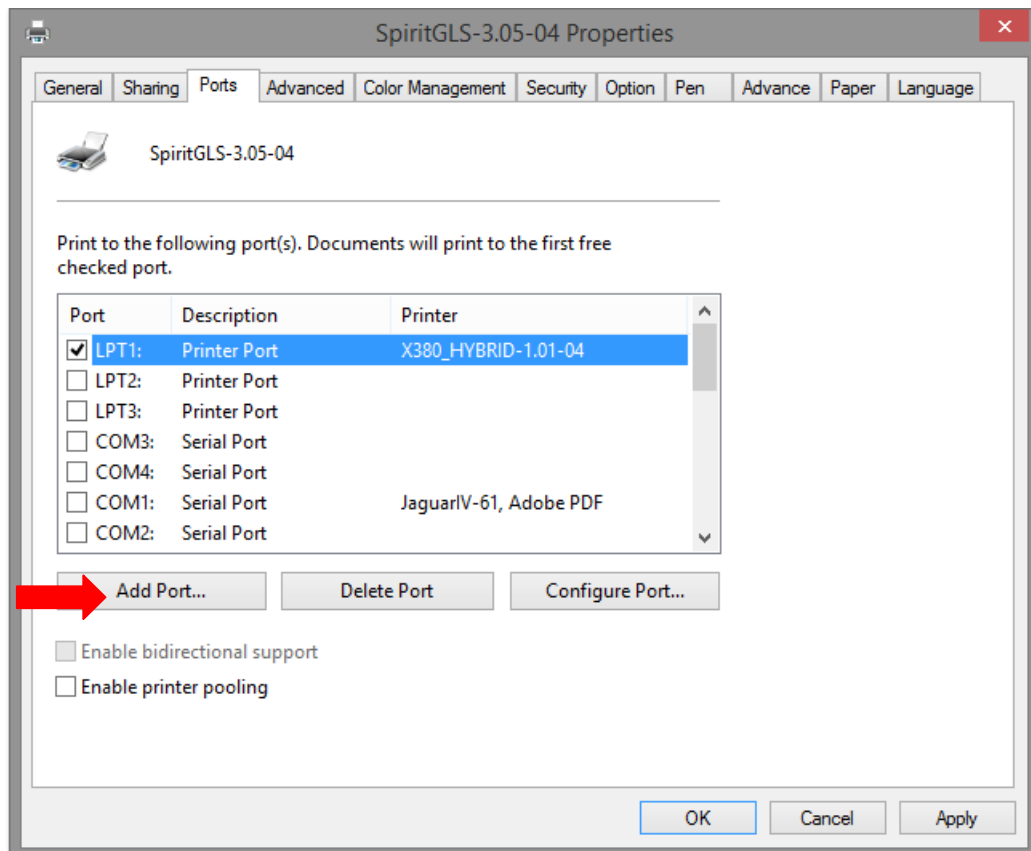
Step 1. Connect LAN cable to the LAN port of GCC laser engravers and turn on machine

Step 2. Navigate the control panel through <F4> Function→ <Machine Setting>→ <LAN Setup Wizard>→ IP Address.

```
IP  : 192.168.100.103
MASK: 255.255.254.   0
GATE: 192.168.100.254


Back
```
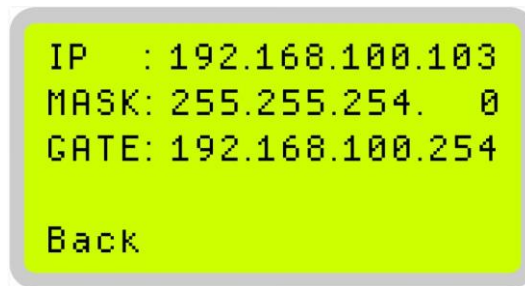
Step 3. Go to Windows <Control Panel>→ <Hardware and Sound>→ <Printer>, and right click on Spirit series printer to check printer properties.

Step 4. Go to <Ports> tab of Spirit series printer properties, and select <Add Port>, and follow the instruction to enter the TCP/IP information received from laser machine control panel in step 2.

SpiritGLS-3.05-04 Properties

General | Sharing | Ports | Advanced | Color Management | Security | Option | Pen | Advance | Paper | Language

SpiritGLS-3.05-04

Print to the following port(s). Documents will print to the first free checked port.

Port	Description	Printer
☑ LPT1:	Printer Port	X380_HYBRID-1.01-04
☐ LPT2:	Printer Port	
☐ LPT3:	Printer Port	
☐ COM3:	Serial Port	
☐ COM4:	Serial Port	
☐ COM1:	Serial Port	JaguarIV-61, Adobe PDF
☐ COM2:	Serial Port	

Add Port...   Delete Port   Configure Port...

☐ Enable bidirectional support
☐ Enable printer pooling

OK   Cancel   Apply

Printer Ports

Available port types:

Adobe PDF Port Monitor
Local Port
Standard TCP/IP Port
UCP

New Port Type...   New Port...   Cancel

Add Standard TCP/IP Printer Port Wizard

Welcome to the Add Standard TCP/IP Printer Port Wizard

This wizard helps you add a port for a network printer.

Before continuing be sure that:
1. The device is turned on.
2. The network is connected and configured.

To continue, click Next.

< Back   Next >   Cancel

001260G(12)

Add Standard TCP/IP Printer Port Wizard

Add port
For which device do you want to add a port?

Enter the Printer Name or IP address, and a port name for the desired device.

Printer Name or IP Address: 192.168.100.103

Port Name: 192.168.100.103

< Back   Next >   Cancel

Add Standard TCP/IP Printer Port Wizard

Additional port information required
The device could not be identified.

The device is not found on the network. Be sure that:

1. The device is turned on.
2. The network is connected.
3. The device is properly configured.
4. The address on the previous page is correct.

If you think the address is not correct, click Back to return to the previous page. Then correct the address and perform another search on the network. If you are sure the address is correct, select the device type below.

Device Type

⦿ Standard   Generic Network Card

○ Custom   Settings...

< Back   Next >   Cancel

Add Standard TCP/IP Printer Port Wizard

Completing the Add Standard TCP/IP Printer Port Wizard

You have selected a port with the following characteristics.

SNMP: No

Protocol: RAW, Port 9100

Device: 192.168.100.103

Port Name: 192.168.100.103

Adapter Type: Generic Network Card

To complete this wizard, click Finish.

< Back   Finish   Cancel

232001260G(12)
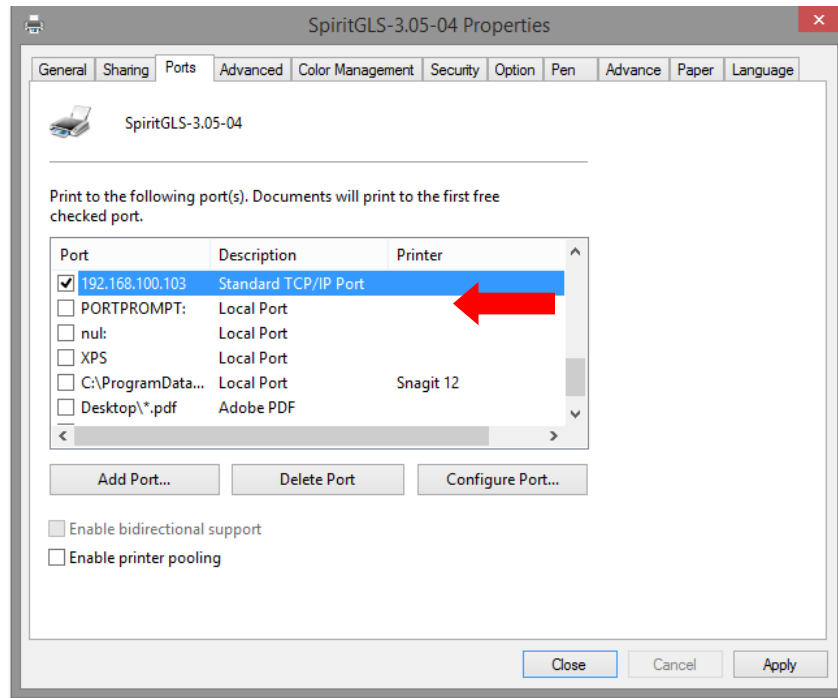
## 4.1.10.2 Ethernet Connectivity Setup

GCC laser engraver is built-in with LAN port to transmit data from PC to laser engraver with ease and higher speed instead of USB port option.

Step 1. Connect LAN cable to the LAN port of GCC laser engravers and turn on machine

Step 2. Navigate the control panel through <F4> Function→ <Machine Setting>→ <LAN Setup Wizard>→ DHCP: OFF.

Step 3. Navigate the control panel through <F4> Function→ <Machine Setting>→ <LAN Setup Wizard>→ IP Address.

Step 4. Enter 192,168,3.X (X refers to 1~255 value which can't be the same value with IP address setting in PC or Notebook) for IP, and 255.255.255.0 for MASK with UP/ DOWN keys.
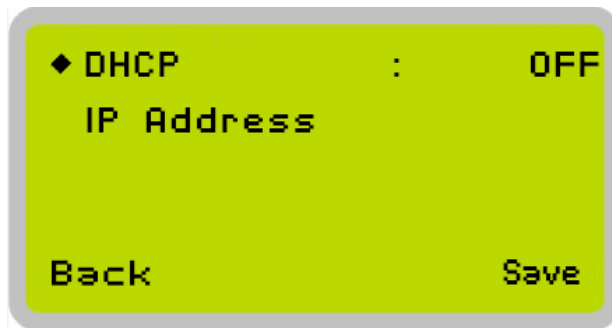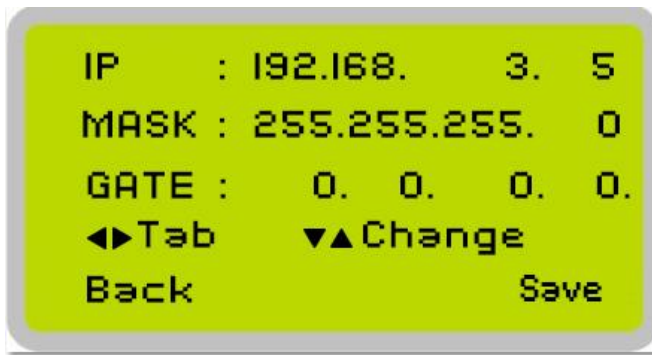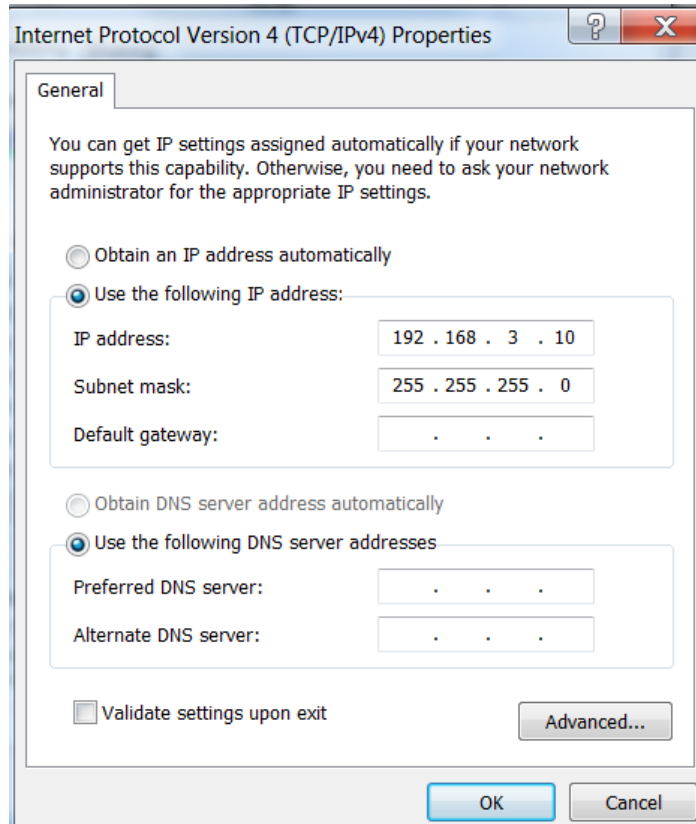
Step 5. Go to <Control Panel→Network and Internet→Network Connections> of computer, right click mouse on the connected internet device, and choose <Properties>

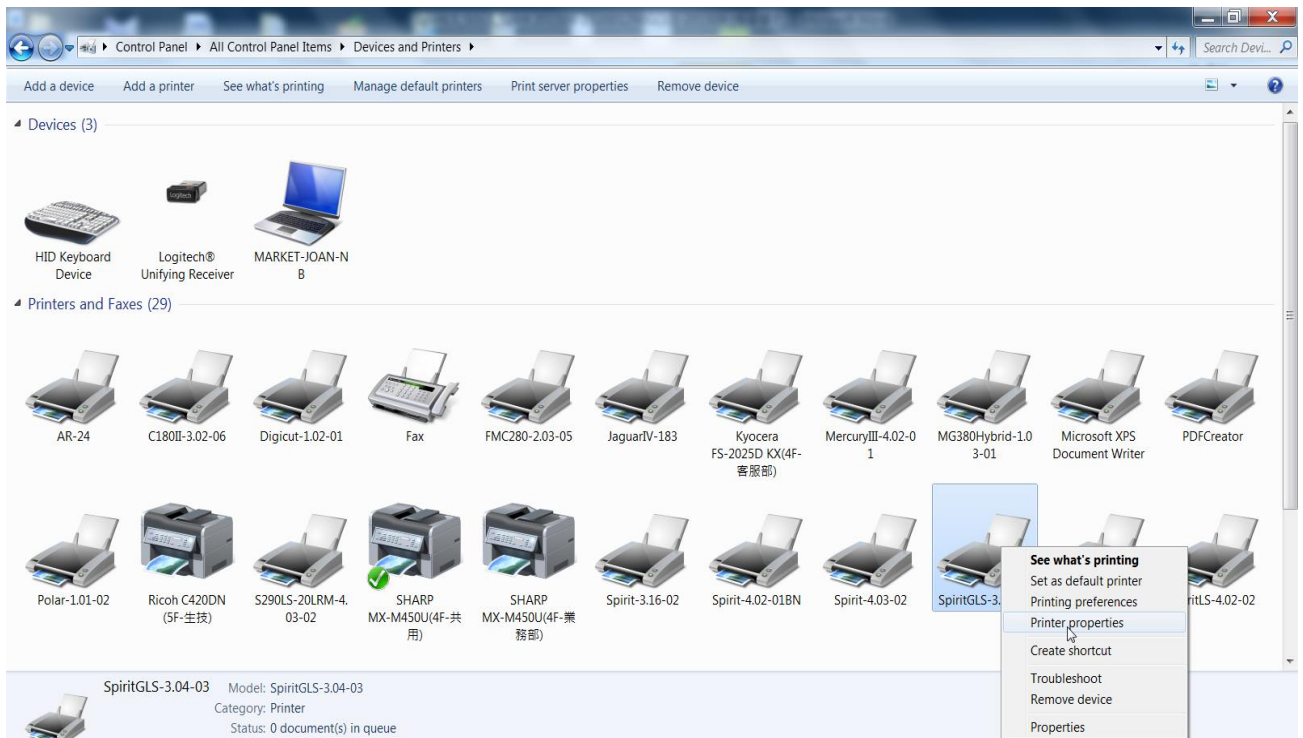

Step 6. Choose the <Internet Protocol Version 4(TCP/IPv4)> and click <Properties> to open up the setting window.
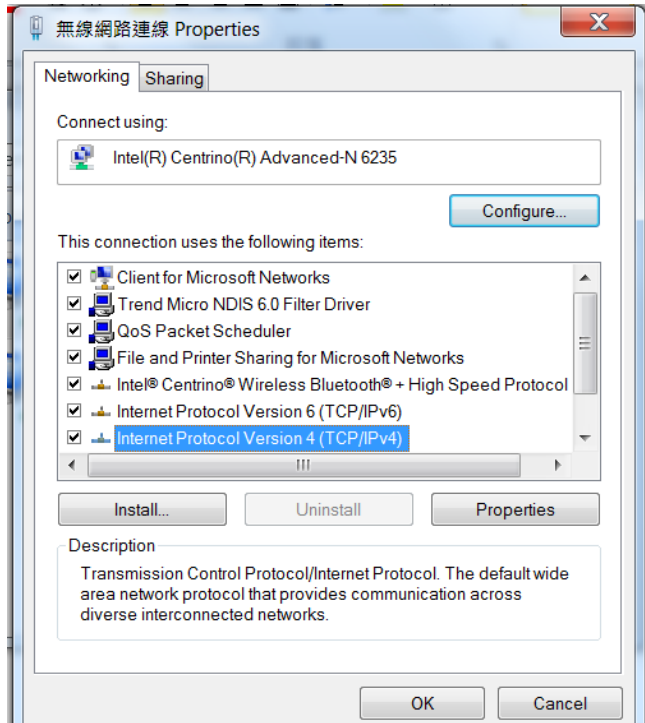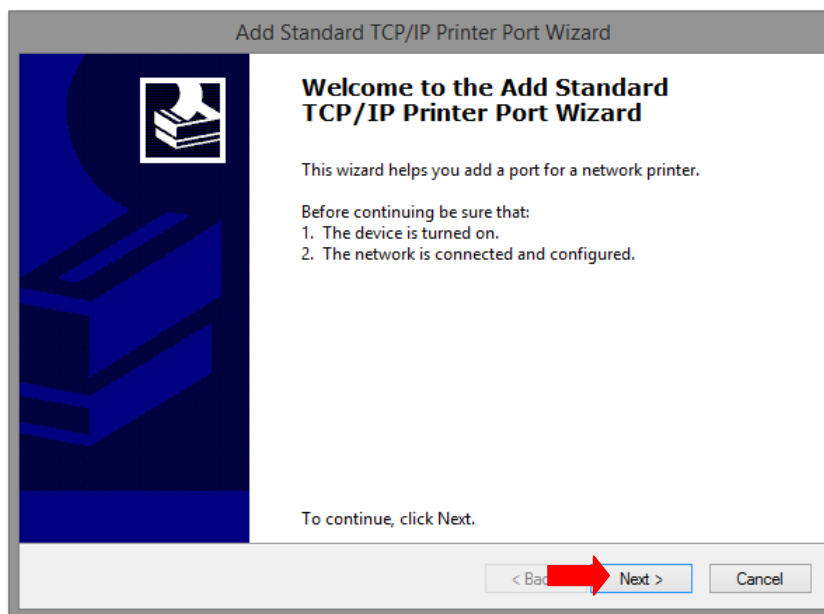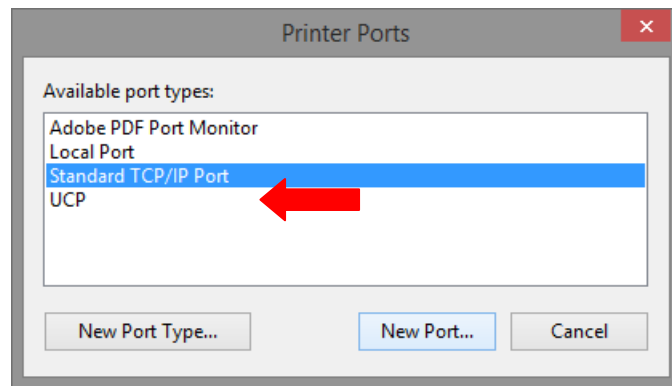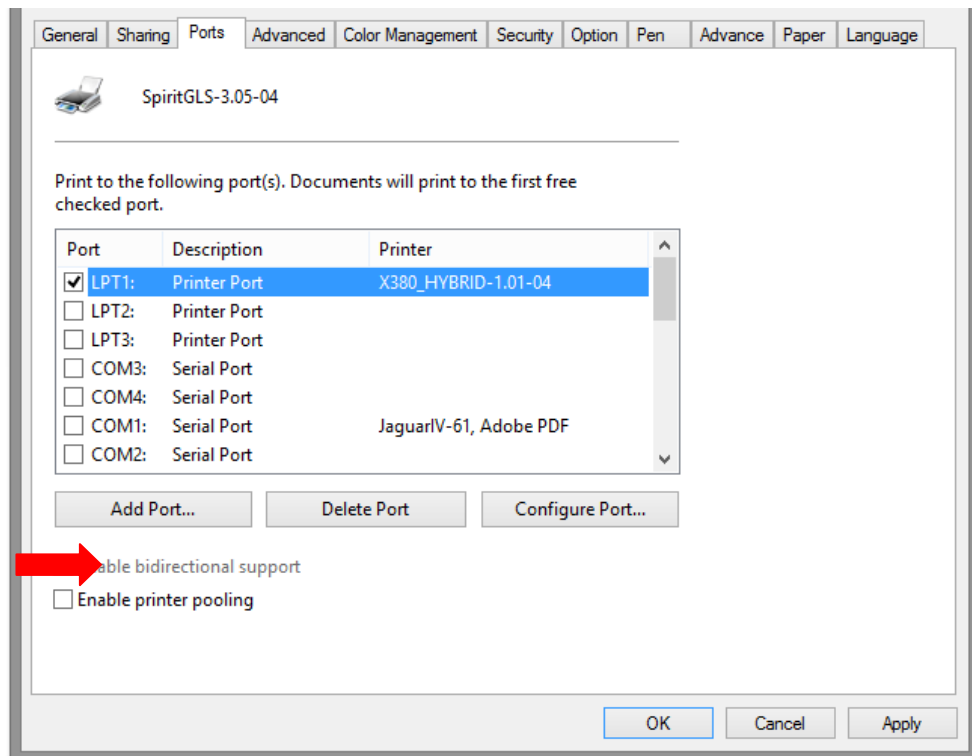
Step 7. Enter the IP address and Subnet mask setting values, and choose <OK>
Note the IP address 192.168.3.X (X value can be 1~255, while can't be the same number as machine control panel setting in step 4)

Step 8. Go to <Control Panel> → <Device and Printers> of computer and right click on the laser machine printer, choose <Printer Properties>.

Step 9. Select <Add Pot> under Ports tab, and follow the instruction to enter the TCP/IP information in laser machine's control panel in step 4.

Add Standard TCP/IP Printer Port Wizard

Add port
    For which device do you want to add a port?

Enter the Printer Name or IP address, and a port name for the desired device.

Printer Name or IP Address: 192.168.3.10

Port Name: 192.168.3.10

< Back   Next >   Cancel

Add Standard TCP/IP Printer Port Wizard

Additional port information required
    The device could not be identified.

The device is not found on the network. Be sure that:

1. The device is turned on.
2. The network is connected.
3. The device is properly configured.
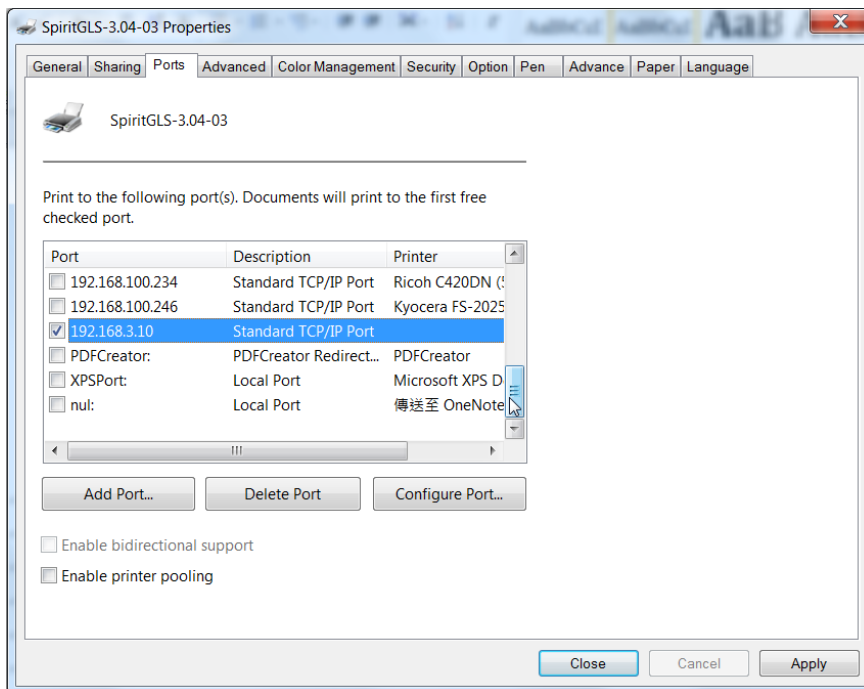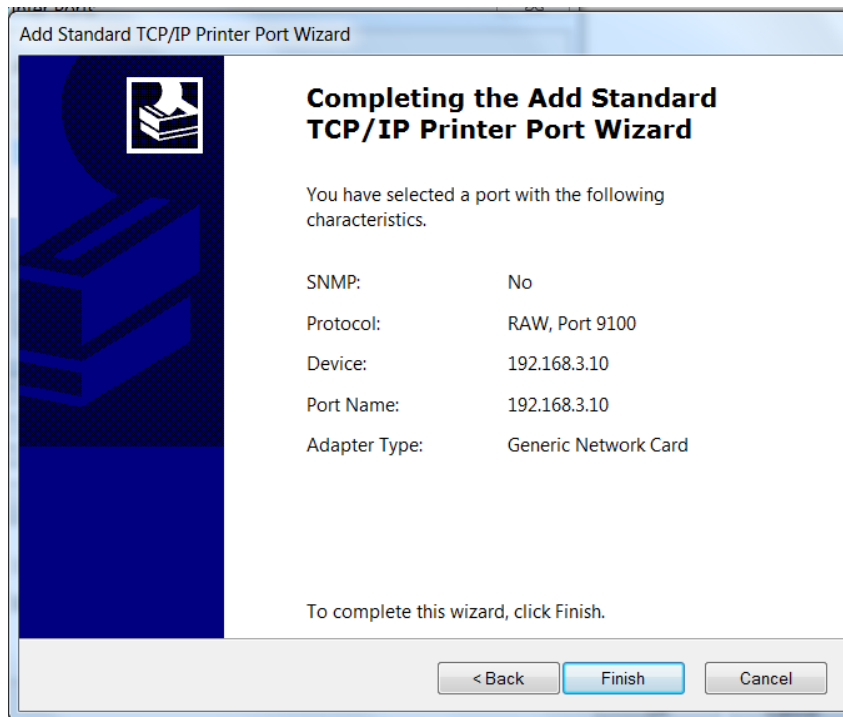4. The address on the previous page is correct.

If you think the address is not correct, click Back to return to the previous page. Then correct the address and perform another search on the network. If you are sure the address is correct, select the device type below.

Device Type
    ◉ Standard   Generic Network Card   ⮟
    ○ Custom   Settings...

< Back   Next >   Cancel

Troubleshooting

While users configure the Ethernet setting precisely with DHCP = OFF (assign the machine a static IP) referring to the manual, sometimes the communication might still not be able to work, at this time you can refer to below actions to have a basic troubleshooting with IT technician.

1. Verify the IP addresses you are using to see if they are valid.
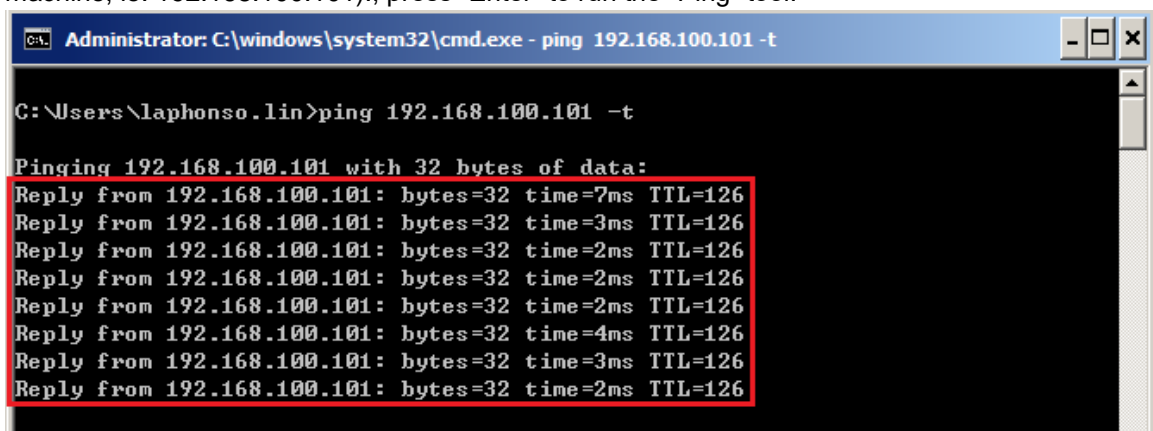
i. Open command line mode in your windows system (Press Windows key + R, the "Run" window will appear, type "CMD" in the blank bar then press "OK" to open command line mode)
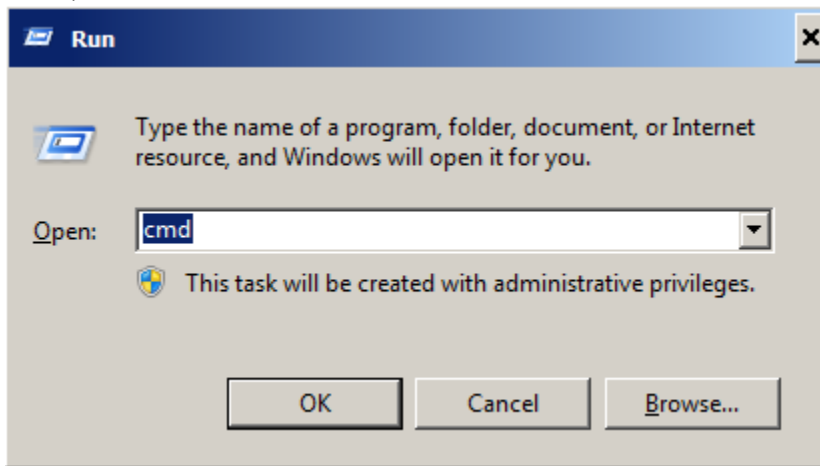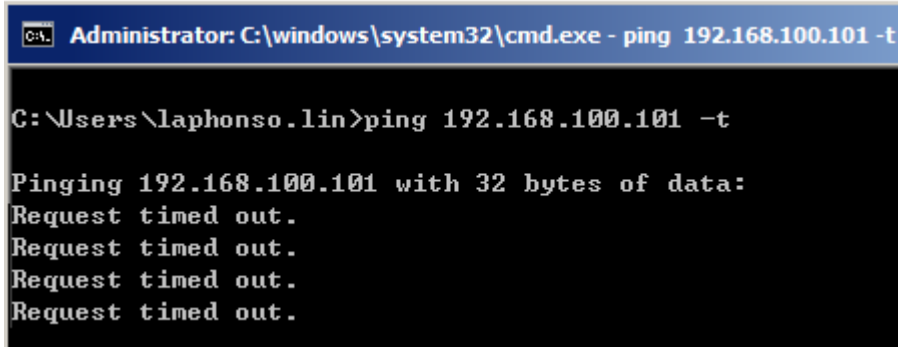

Command line mode window
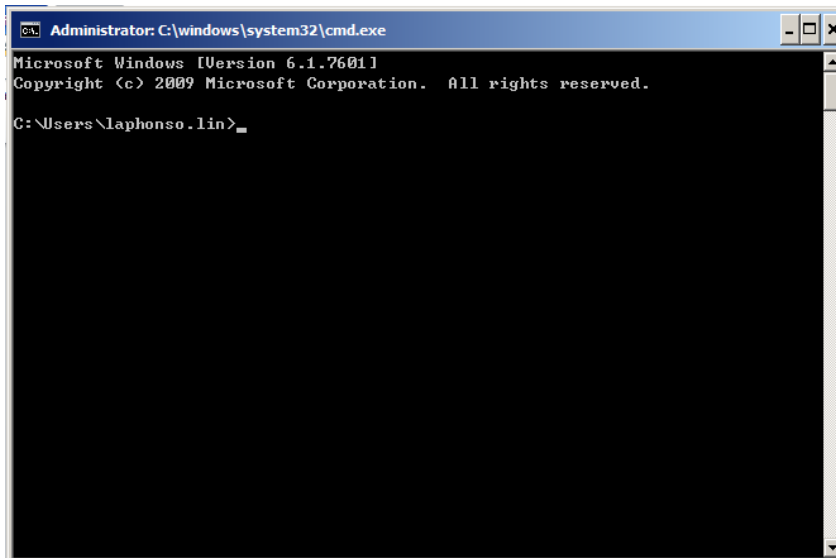
ii. Type "ping x.x.x.x –t" after the prompt symbol, (x.x.x.x is the IP address you set on the laser machine, ie: 192.168.100.101)., press "Enter" to run the "Ping" tool.

If the communication is OK between your PC and Laser machine, you will see reply from the destination IP.

If the communication is not ok, you will see "Request timed out" message from destination IP.

2. **Diagnostics**

a. For cases the communication is not ok (can't get response, just have "Request timed out" from destination IP), you can look for two PC/Laptops which are original set in the LAN environment and work ok (they can get normal response from each other by the command "PING"), note down the TCP/IP configurations by running "ipconfig" on both PC/Laptops (press "Windows key + R" to call the "Run" windows, type "CMD" in the blank bar, press enter to start command line mode,
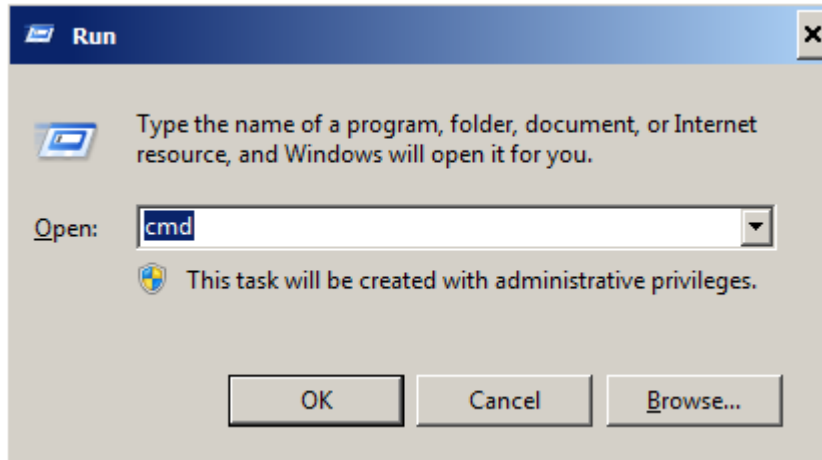
type "ipconfig" after the prompt symbol then press enter, the TCP/IP configurations of this PC/Laptop will show as below)

Set those two IP addresses to the laser machine and the PC/Laptop which you want to communicate with laser.

Test Ping again to see if you can get normal response from destination IP, if the communication is normal now (can get reply from destination IP), we can be sure the IP addresses we set originally are invalid, ask the LAN administrator to provide us a proper one.

b. Directly connect the Laser machine and PC/Laptop using the RJ45 cable without any router/switch..etc. in between, test PING and send files, if the files can be sent and the result of PING is normal (can get response from destination IP), the Ethernet function of GCC laser is normal, it should be something wrong in the LAN environment , ask the administrator of the LAN to solve the problem.

4.2 Graphics Software Setup

The LaserPro X500 SERIES is compatible with graphics software that can output HPGL commands, such as CorelDraw, Adobe Photoshop, AutoCAD, Illustrator etc.

Supported Graphic Software
- Photoshop
- CorelDraw
- Illustrator
- AutoCAD

Other software such as EngraveLab and PhotoGrav may work with the LaserPro X500 SERIES, but are not officially supported. Any software that can output to the LaserPro Print Driver should work.

> *NOTE*
> - Support will not be offered, if you experience output problems with non-supported graphics software.

4.2.1 Recommended Computer Configuration

The LaserPro X500 SERIES operates under Windows operating systems and is designed to work on a computer that meets the following minimum requirements.

Computer

- CPU   Pentium 90 (or equivalent) or greater
- RAM   32MB or higher
- FDD   One 3.5" 1.44 MB Floppy Disk Drive
- HDD   1.2 GB Hard Drive or greater
- SVGA   15" Super VGA Monitor
- On Board Parallel Mode (Enabled from your motherboard's BIOS):
- SPP – Preferred Mode
- ECP – Cable (Less than 1.8 meters)

Software
- The LaserPro X500 SERIES drivers are designed for Windows 2000, 7 or newly developed operating systems.

4.2.2 Installation of the LaserPro Print Driver

1) Insert the LaserPro CD.
2) From the auto run menu, select X500 SERIES → LaserPro Driver to start the LaserPro Print Driver installation.
3) When the Add Printer Wizard menu comes up, click **Next** to continue.
4) At the Local or Network Printer page, select <Local printer attached to this computer>, then click **Next** to continue.
5) At the Select a Printer Port page, select <Use the following port> and select the port that the LaserPro X500 SERIES will be connected to, then click **Next** to continue.
6) The next screen will prompt you with a list to select the manufacturer and model of your printer. From this menu, click Have Disk. Another menu will now pop up for you to indicate the location of the print driver. With the LaserPro CD still in your drive, click Browse and point to the file located at: E:\X500 SERIES\LaserPro driver\WIN XP\Dv3.45\GL345.inf (where E is the driver letter assigned to your CD-Rom drive) and click OPEN to have LaserPro X500 SERIES displayed as a valid printer.
7) Now select LaserPro X500 SERIES from the list of printers (LaserPro X500 SERIES should be the only printer displayed on the list) and click **Next** to continue.
8) If a screen comes up informing you of the detection of a previous driver and asks to keep the existing driver or use the new one, select Replace Existing Driver and click Next to continue.
9) This screen will prompt you to provide a printer name. Simply type in <LaserPro X500 SERIES> and select Yes or No if you want to use this printer as the default printer and click **Next** to continue.

> ⓘ **NOTE**
> When working with the LaserPro X500 SERIES Print Driver within your graphics software, you will need to have the LaserPro X500 SERIES set as the default printer to get proper output. If you select to not have the LaserPro X500 SERIES be the default printer, please remember to manually change this on your own from within the graphic software printer selection area or from the Windows Control Panel → Printers and Faxes section.

10) At the Printer Sharing screen, select <Do not share this printer> and click **Next** to continue.
11) Select <No> when asked if you want to print a test page and click **Next** to continue.
12) Now simply click Finish to complete the Add Printer Wizard.
13) Now the installation will proceed, if you get a Hardware Warning about the software you are installing for this hardware has not passed Windows Logo testing… simply click Continue Anyway to ignore this warning.
14) Congratulations, your printer driver has been successfully installed!
15) (This step is required only for USB connections) If you are using the LaserPro X500 SERIES's USB connection interface, then you will need to go to your Windows → Control Panel → Printer and Faxes. Right-click on the LaserPro X500 SERIES listing, and select properties. Go to the Ports menu and place a check next to GCC USB0, then click OK.

232001260G(12)

4.2.3 Parallels Desktops for MAC OS

MAC users can use GCC LaserPro machines by purchasing the Parallels Desktop software which allows you to install Windows OS in MAC computers and run Windows based software under MAC computer and output with GCC print driver.

1) Purchase Parallels Desktops on its official website.

2) Install Parallels Desktops under Mac OS environment.
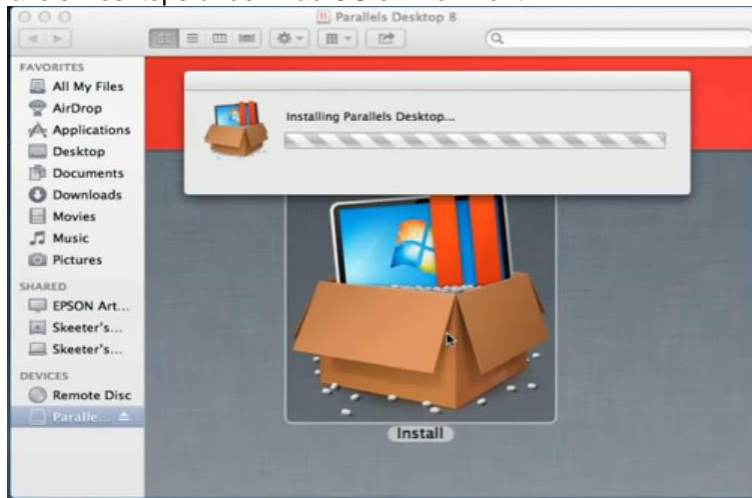
3) Read Software License Agreement and press "Accept" to continue installation
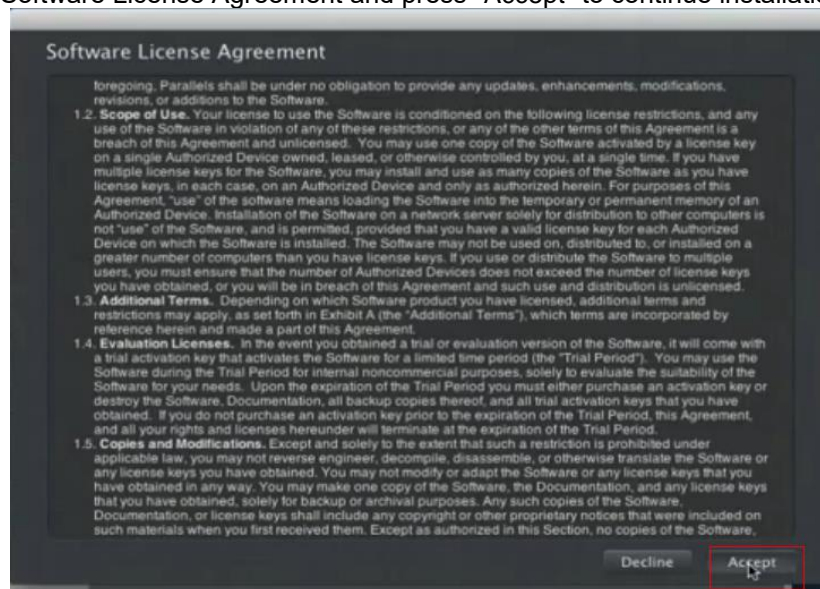
4) Enter your Mac OS X User Name and Password then press "OK"
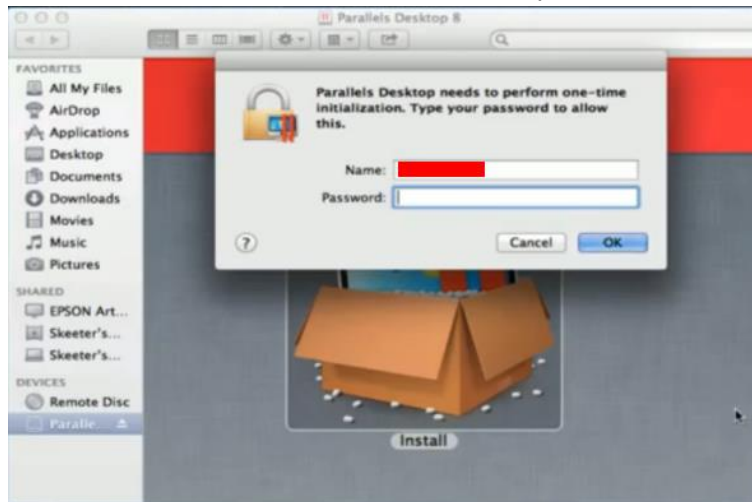
5) Press "Active"
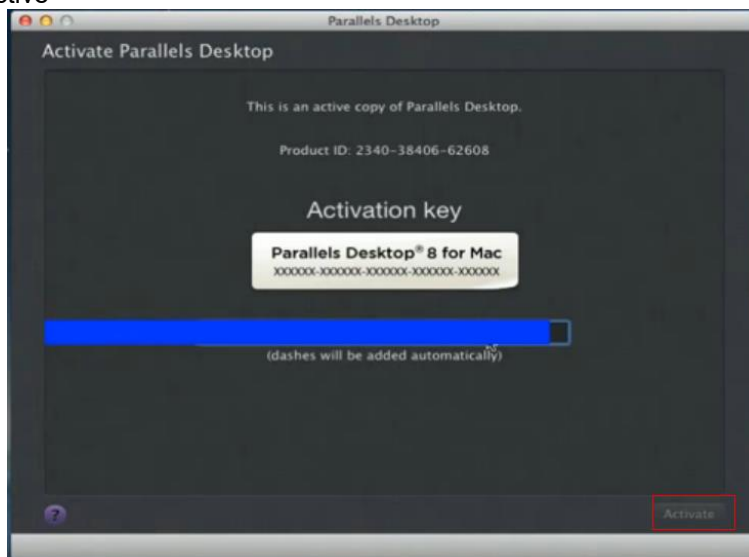
6) Press "OK" when activation is complete.
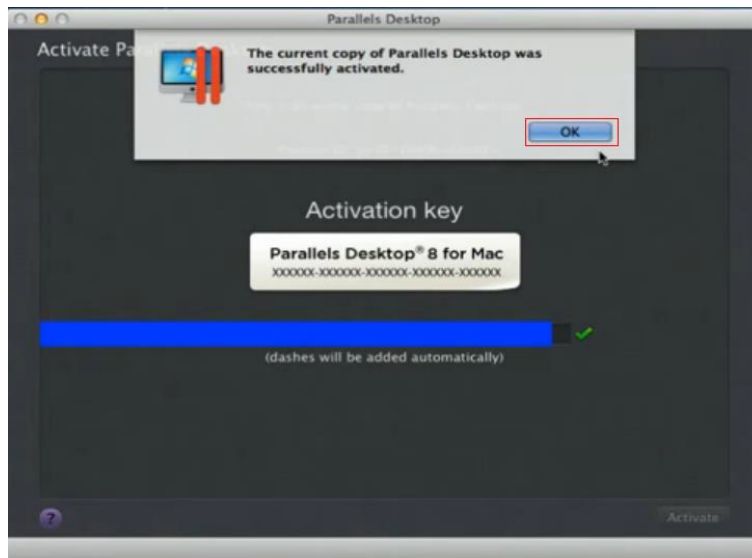
7) Register Parallels Desktop
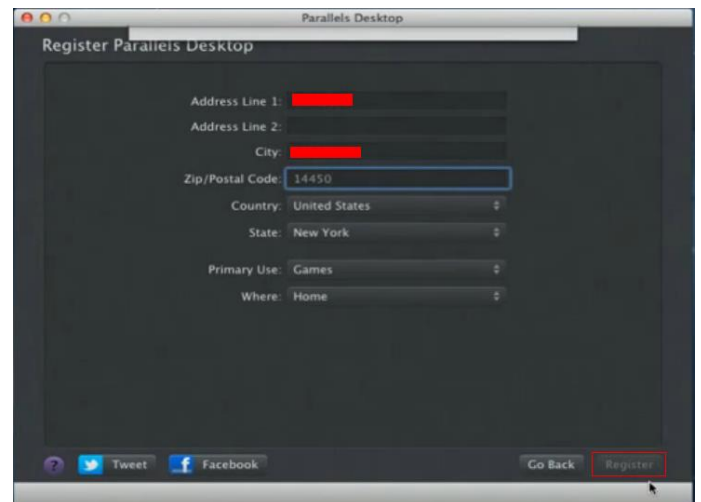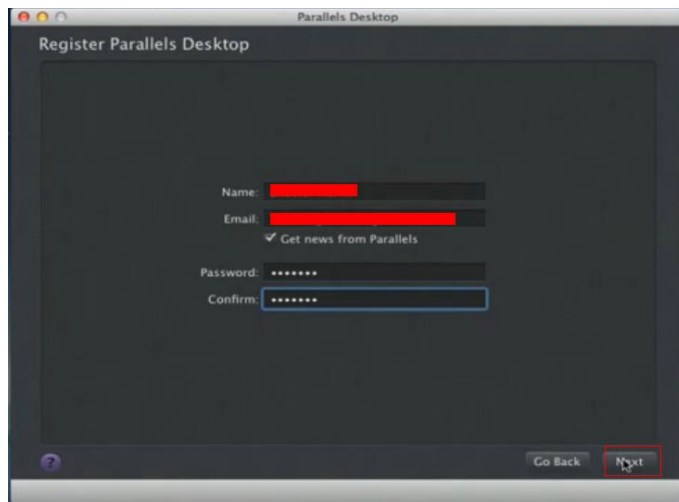
8) Press "Register" and "OK" to complete the installation of Parallels Desktop.
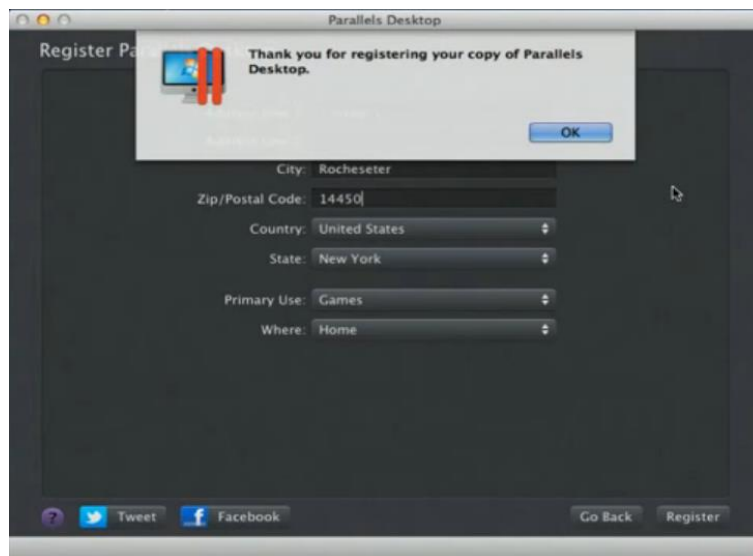
9) Open **Parallels Desktop** (in the **Applications** folder) then choose **File → New**

10) Press "Install Windows from DVD or image file" then press "continue" to install windows OS

11) Select CD-ROM drive with the Windows installation CD

12) Enter the Windows OS product key
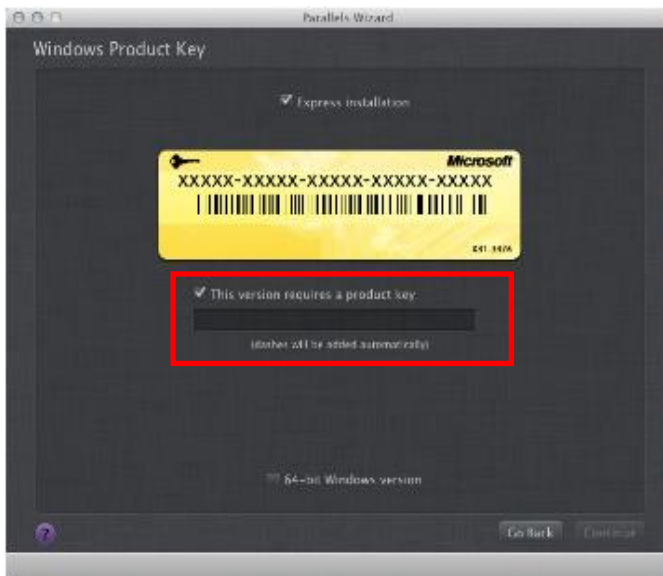
13) Select how you would like to run your Windows program.

14) After the prior setting is complete the windows OS installation procedure will start automatically.
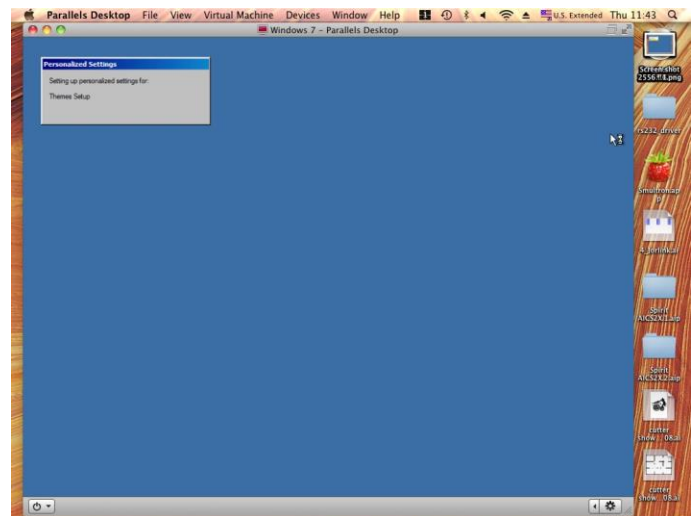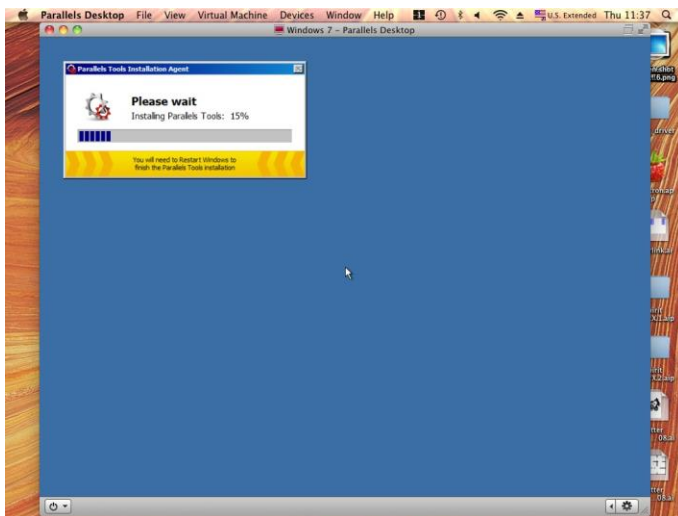
15) Windows OS installation is complete then you can refer to "4.2.5 Installation of the LaserPro Print Driver" to install GCC LaserPro Print Driver.

16) Install the AP that you want to use after the above installation is complete.

4.2.4 Using Adobe's AP with GCC LaserPro machine

The Adobe's AP (e.g. Illustrator, Photoshop or Acrobat reader) processes files via its Advanced Printing Features; users should firstly deselect Enable Advance Printing Features; otherwise the machine is unable to recognize or read general files when uploaded.

● Deselect "Enable Advance Printing Features"

1) Click to select → Control Panel → Devices and Printers
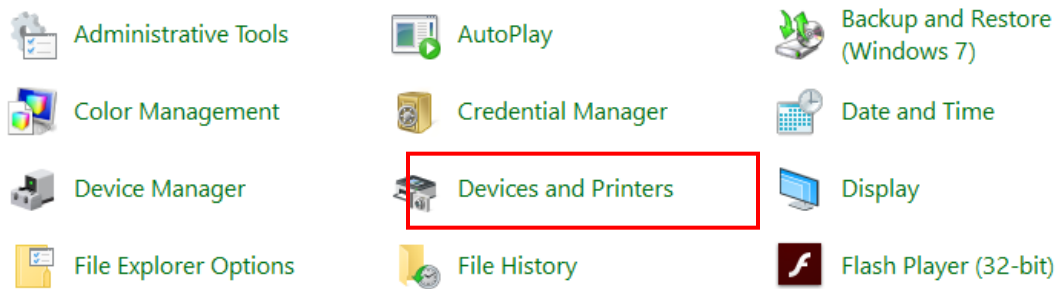
2) Select your printer (for example, Spirit), right-click your mouse and choose Properties to enter Spirit Properties setup
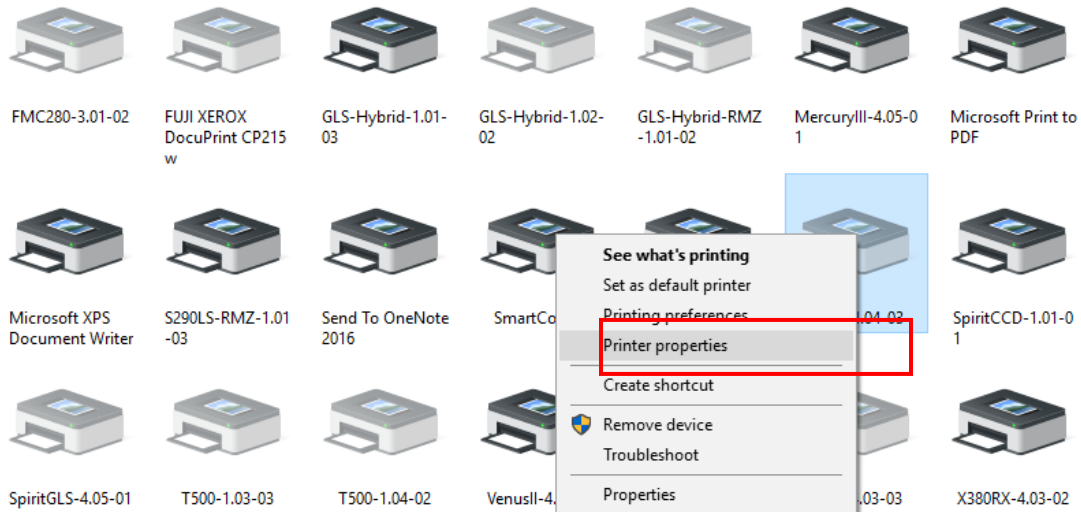
3) The click the Advanced tab, then deselect Enable Advanced Printing Features, now all files can be recognized and uploaded.

Spirit-4.04-03 Properties

General | Sharing | Ports | **Advanced** | Color Management | Security | Options | Pen | Advanced | Paper | Language

◉ Always available

○ Available from [12:00 AM] To [12:00 AM]

Priority: [1]

Driver: [Spirit-4.04-03] ∨ [New Driver...]

◉ Spool print documents so program finishes printing faster
   ○ Start printing after last page is spooled
   ◉ Start printing immediately
○ Print directly to the printer

☐ Hold mismatched documents
☐ Print spooled documents first
☐ Keep printed documents
☐ Enable advanced printing features

[Printing Defaults...]   [Print Processor...]   [Separator Page...]

[OK] [Cancel] [Apply]

● **File Transfer**

1) Select your working object, and then at the upper toolbar please choose File → Print.

File	Edit	Object	Type	Select	Effect	View

New...   Ctrl+N
New from Template...   Shift+Ctrl+N
Open...   Ctrl+O
Open Recent Files   >
Browse in Bridge...   Alt+Ctrl+O

Close   Ctrl+W
Document Setup...   Alt+Ctrl+P
Document Color Mode   >
File Info...   Alt+Shift+Ctrl+I

Print...   Ctrl+P

Exit   Ctrl+Q
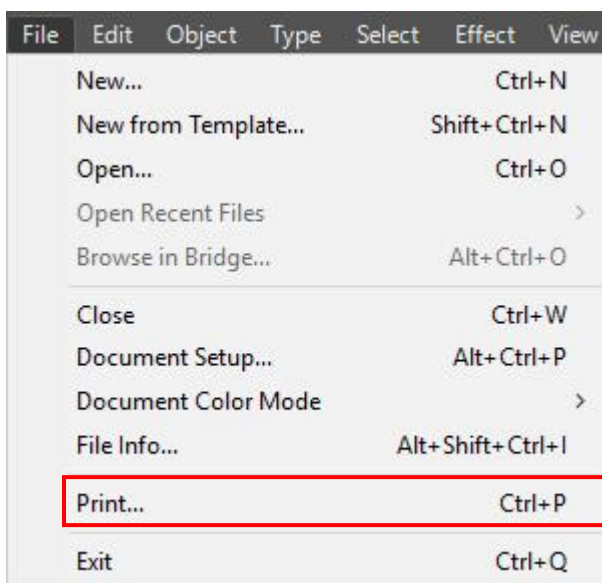
2) At the print setup screen, at Print Preset please select Custom, and choose your printer (e.g. Spirit)
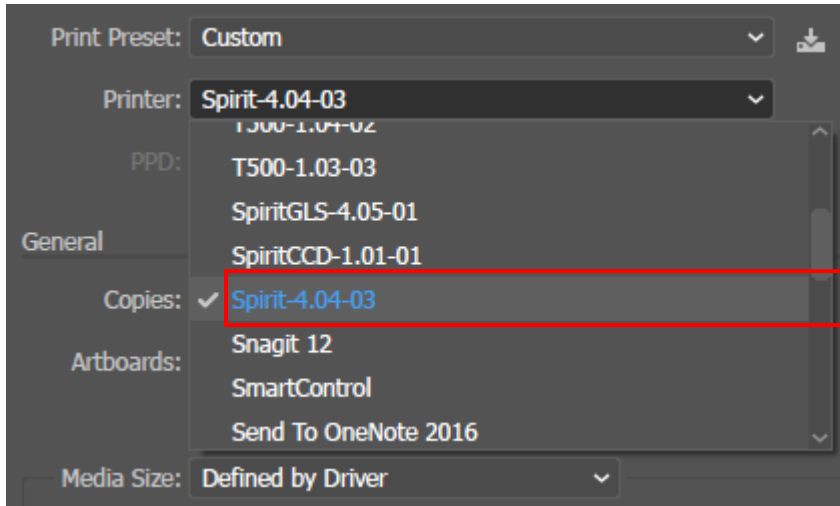
3) Then click on the lower left tab of Setup to enter Preferences settings.
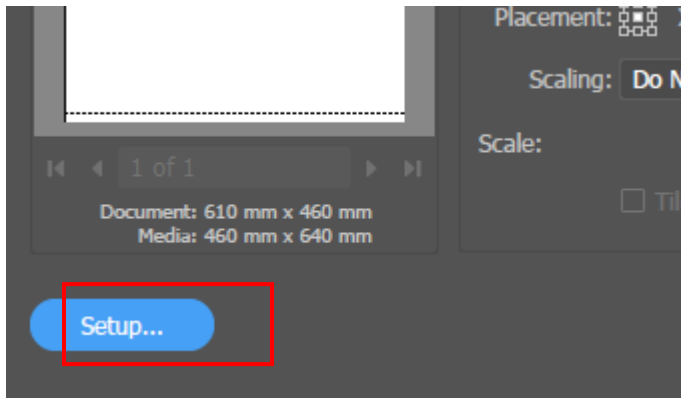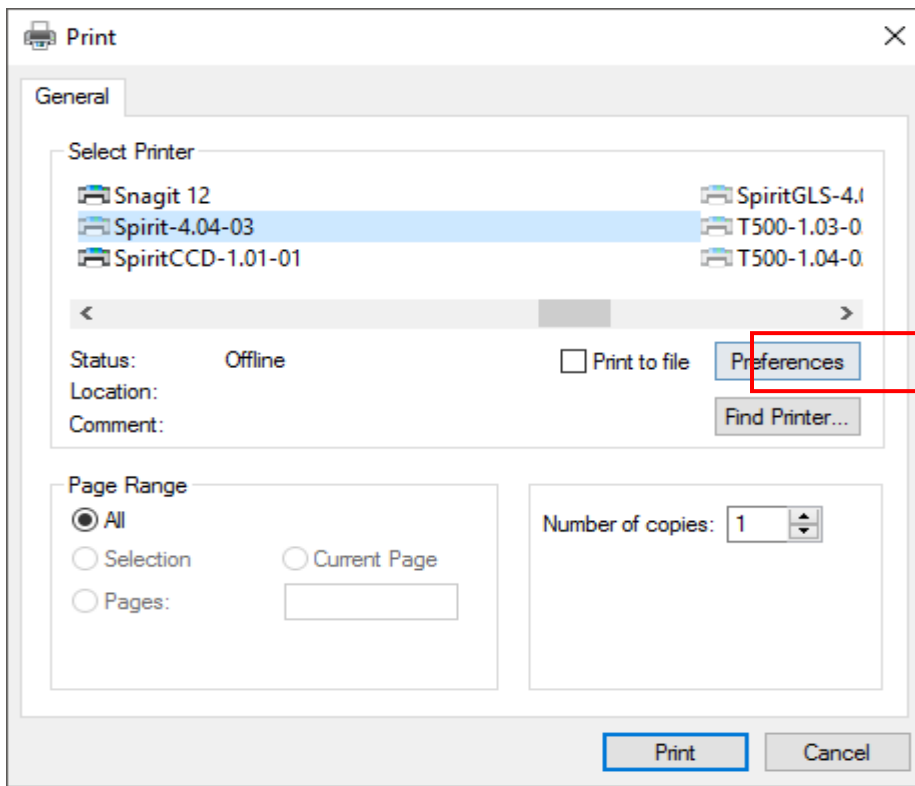
4) After all preferences are set, click Print to send file to the machine for print out.
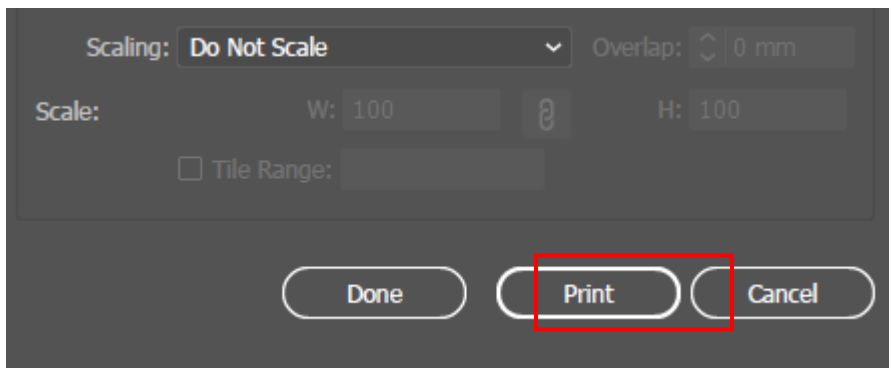
4.2.5 Using Autodesk Inventor with GCC LaserPro machine

1. Start drawing.
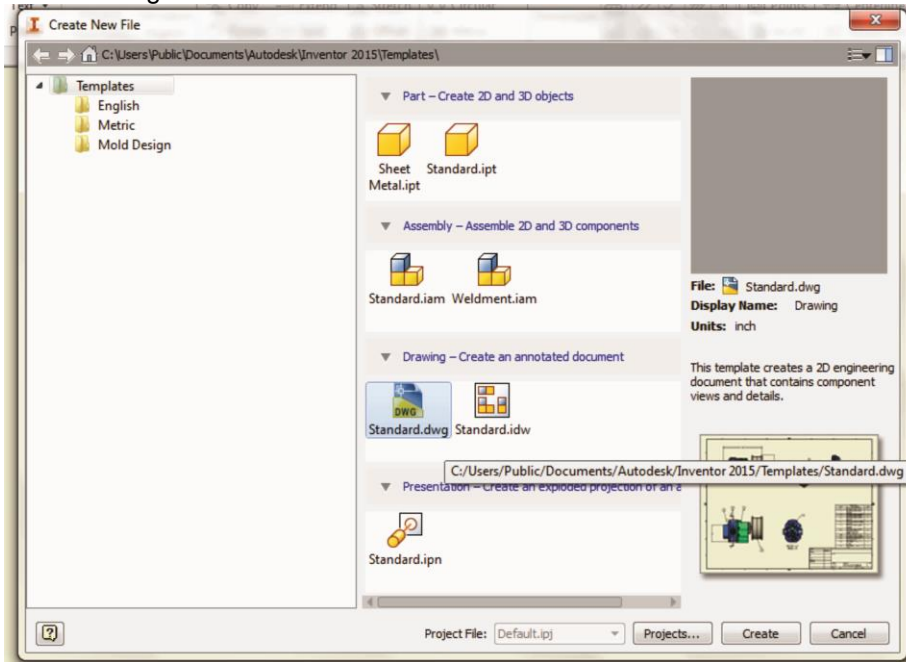
2. Delete border and title block by right clicking on sheet1 and selecting delete.

Right click and delete sheet.
(If you would like border and title block sent to the engraver skip this step.)
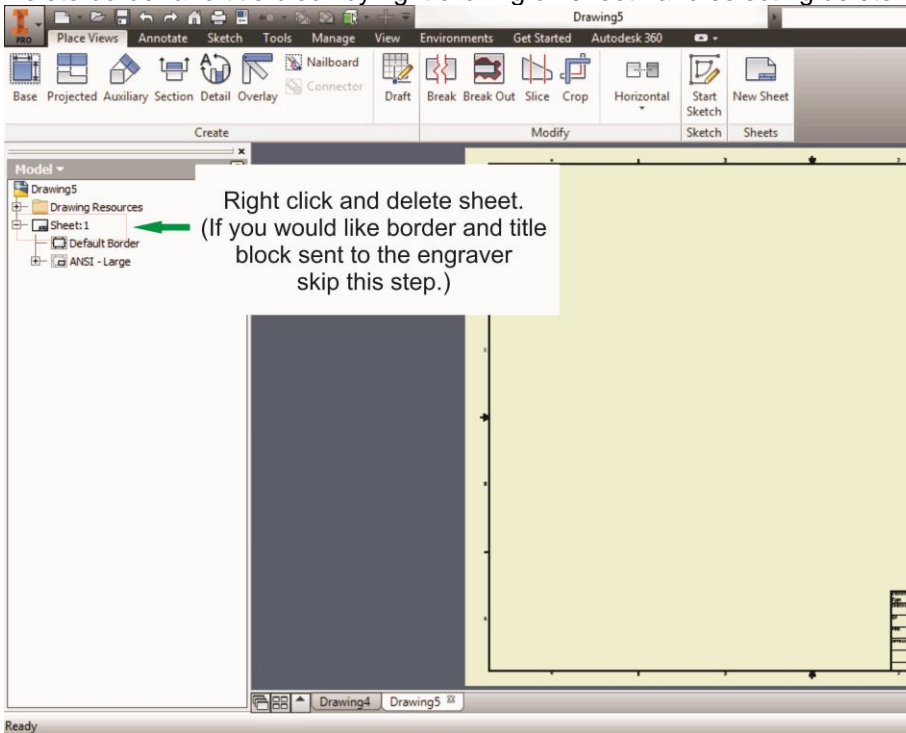
3. Set sheet size to match working area of engraver. Engraver working area can be found on the paper tab of the windows driver.

Right click and select edit sheet.

Select custom size and input dimensions found on paper tab of windows driver.
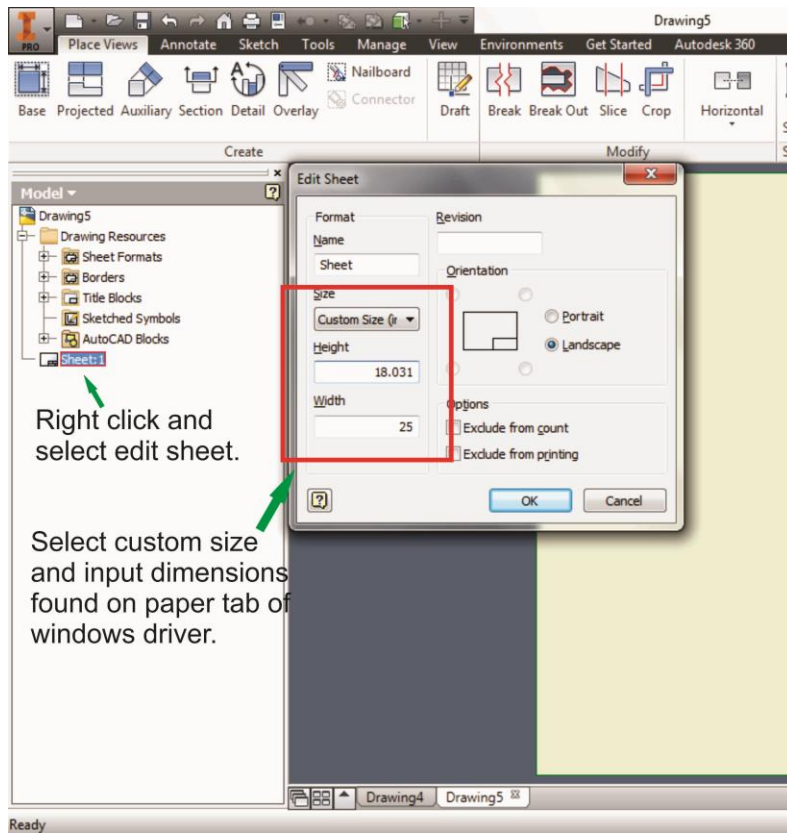
4. Start sketch.

5. Engraving
   a. Finish sketch.
   b. Right click on sketch and select properties.
   c. Line Type: By Layer
   d. Line Weight: By Layer
   e. Set color to match one of the 16 colors available in the pen tab of the windows driver.

Right click and select properties

Select color that matches one of the 16 available colors in the pen tab of the windows driver.
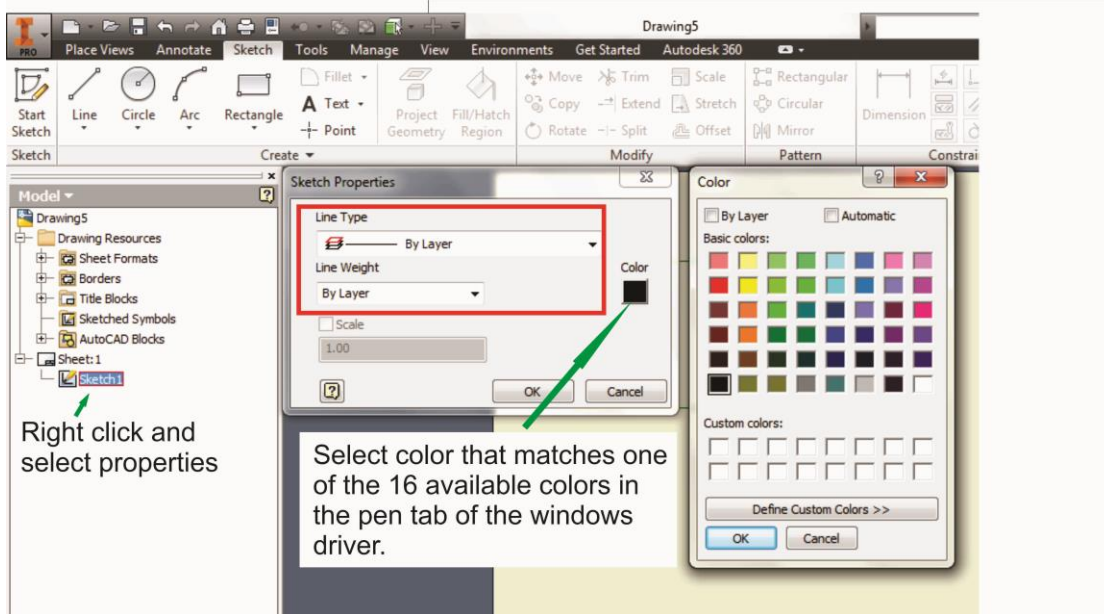
6. Cutting
    a. Finish sketch.
    b. Right click on sketch and select properties.
    c. Line Type: Continuous
    d. Line Weight: .001 in.
    e. Set color to match one of the 16 colors available in the pen tab of the windows driver.

Right click and select properties

Change line type to continuous. Set line weight to .001.

Select color that matches one of the 16 available colors in the pen tab of the windows driver.
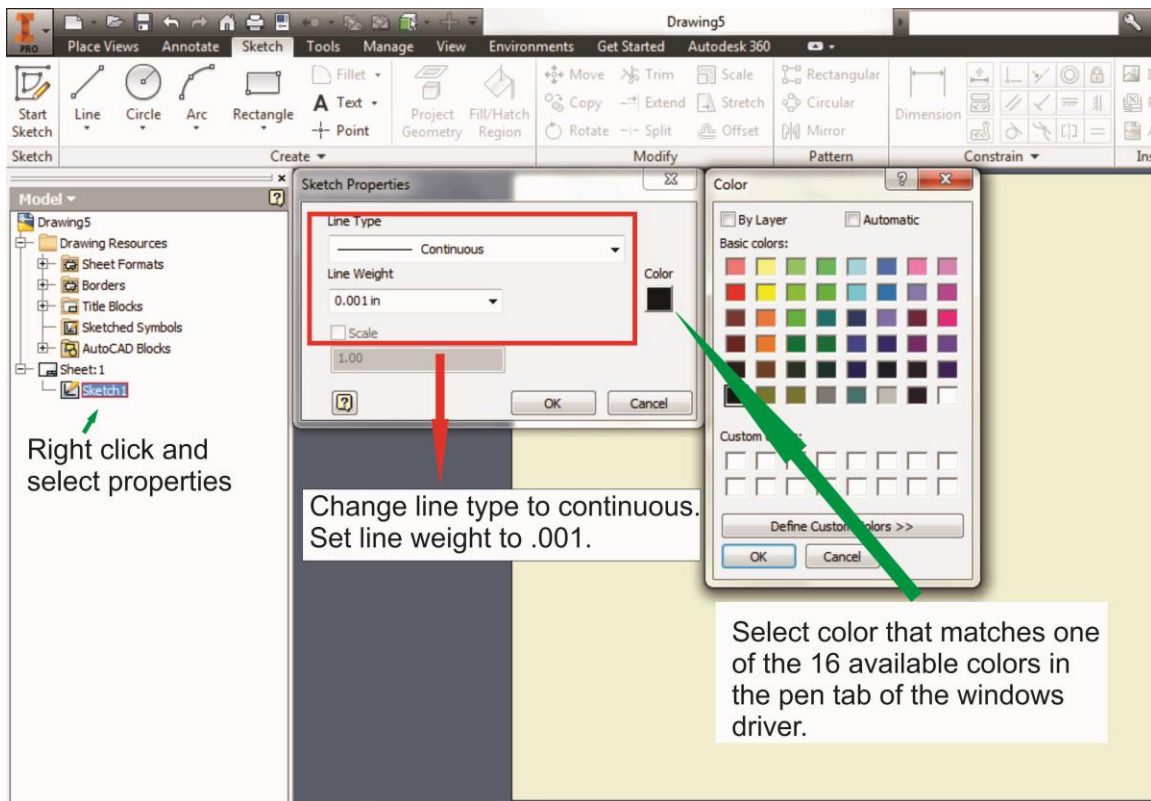
> ⓘ **NOTE**
> All objects created in one particular sketch will have the same properties meaning all will engrave or all will cut. If you would like to engrave and cut in the same job you will need at least two sketches, one with all the engravings and another with all the cuts, to do so properly.

4.2.6 Using eCut Plug-in with GCC LaserPro Machine

eCut is an inexpensive and powerful plugin work under CorelDRAW or Illustrator software with GCC laser systems. It increases the functions Corel Draw or Illustrators doesn't have or simplifies the operations workflow. eCut details and operation videos can be found on http://eng.e-cut.ru/

eCut unique feature list:
- Nesting
- Puzzles
- Material usage calculation
- AutoText to import files including image, text, QR code, and barcode etc. to the linked variable columns.
- Slice/ Tile function
- CAD editing function
- Sign box and packaging box aided design
- 2D barcode

- QR code

Chapter V - Operating the LaserPro X500 SERIES

Once you have installed LaserPro X500 Series Print Driver, and connected the LaserPro X500 SERIES to the computer, you will need to familiarize yourself with the control panel and LaserPro Print Driver. The print driver will be where you spend most of your time configuring specific laser parameters for your jobs, while the control panel will allow you to set repeat times, manipulate the file order, configure the start point, and more.

> ### 🛈 NOTE
> Be sure to power on your water chiller before starting to operate LaserPro X500 SERIES. Water chiller temperature is recommended to be set to 25℃. The laser will not fire if the water chiller is not turned on. To solve this problem, just power on water chiller then restart the LaserPro X500 SERIES.

5.1 Using the Hardware
5.1.1 Adjusting the LCD Display Screen's Contrast Setting

Depending on the lighting of your immediate work area, you may need to adjust the contrast of LCD display screen. You may increase or decrease the contrast via the contrast adjustment wheel found on the inside of the right shoulder. You can access this area by opening the front door and looking inside to the right shoulder (as shown in the picture below).
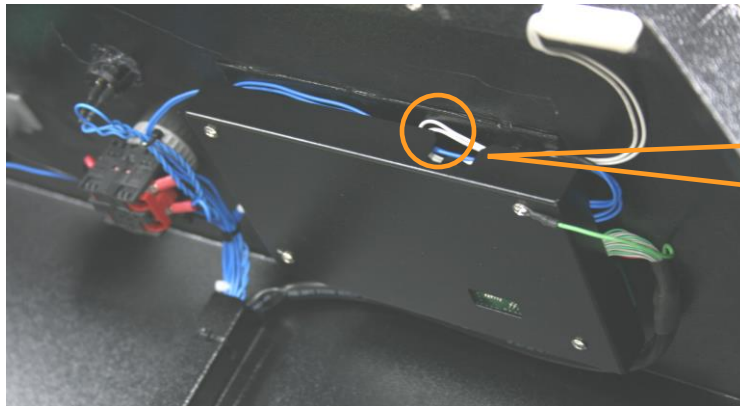
LCD Display Screen's Contrast Adjustment Wheel

5.1.2 Laser Key Switch

Turn the key-switch to the "ON" position BEFORE powering on the machine. If the key-switch is turned to the "OFF" position, the laser will be disabled meaning that the laser will not fire although the XY motion system will still move. The laser firing will need 8-10 seconds to warm up if turning to off, and turn on later, therefore, please wait 10 seconds before pressing STRART button for laser work.

5.1.3 Graphic Control Panel Overview (Description)

The Control Panel

The control panel on the LaserPro X500 SERIES provides an easy access to all the manual controls needed for cutting and engraving. The LCD screen, functional, directional and selection buttons make navigating through the machine's manual controls easy to do.
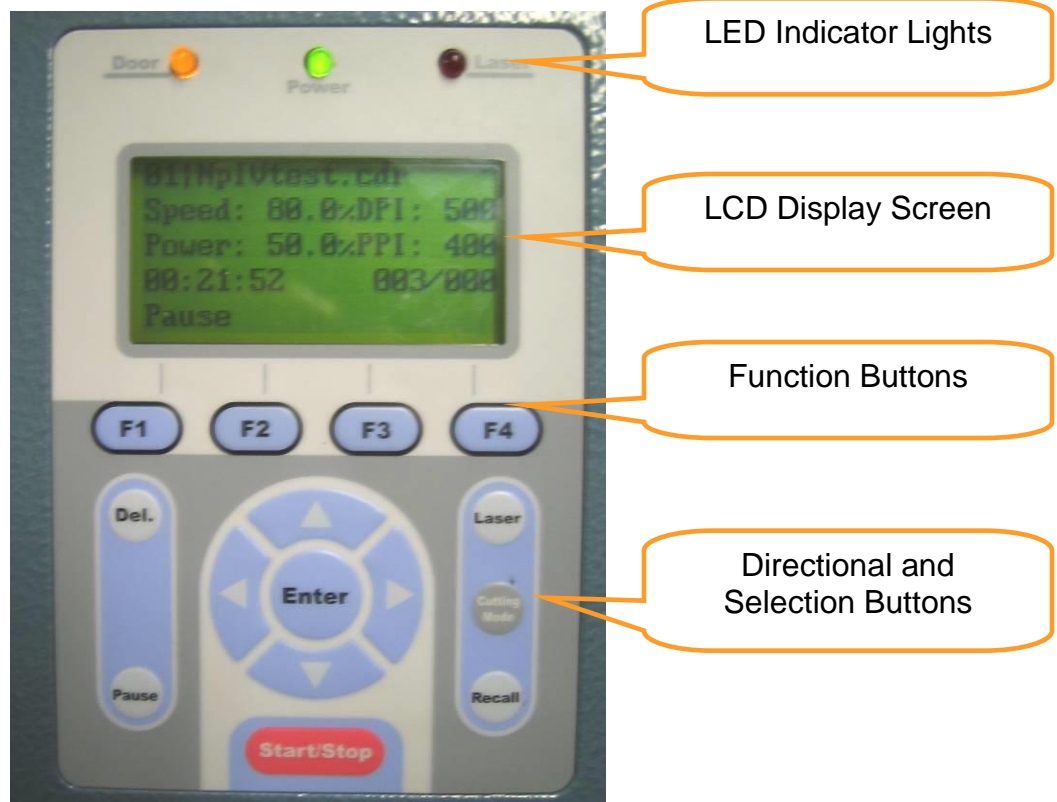
LED INDICATOR LIGHTS

Three indicator lights on the LaserPro X500 SERIES's control panel are part of the system's safety interlock system.

- **DOOR** - The door light will illuminate when either the top lid or external pass through doors on the LaserPro X500 SERIES are open or improperly closed.
- **POWER** - The power light will illuminate when the LaserPro X500 SERIES is powered on.
- **LASER** - The laser light will illuminate when the laser is active and in operation.

> ⚠️ **WARNING**
> - **DO NOT** attempt to remove or modify any component of the safety interlock system.
> - If at any time, any of the access doors are open and the "laser" LED is illuminated, **IMMEDIATELY** unplugs the laser system and contact GCC technical support for service instructions.
> - **DO NOT** operates the laser system if any component of the safety system is malfunctioning.

DIRECTIONAL AND SELECTION BUTTONS

Function (F1 / F2 / F3 / F4)
Four function buttons allow you to select various functions, which will change depending on what section of the menu you are in. Each function button's corresponding function will be displayed right above its respective button on the LCD display screen. Please note that in certain menus, not every function button will always be mapped to a corresponding action. In these situations, that particular button will not have a function.

Directional ($\triangle$ / $\triangledown$ / $\triangleleft$ /$\triangleright$)
Four directional buttons allow you to navigate the selection cursor through the control panel menu and adjust the value of specific settings. In general, the $\triangle$ / $\triangledown$ directional buttons cycle through the various selections, while the $\triangleleft$ / $\triangleright$ directional buttons adjust the value of that particular selection.

Enter – Confirms the current selection.

Start / Stop – Allows you to start or stop engraving jobs, once those jobs have been successfully loaded onto the system.

Delete - Provides quick access to delete the current job.

Pause – Pauses the current engraving process. Press again to resume the current process.

Cutting Mode – Cutting mode key would access to the three options of cutting quality and speed combination

LASER
The Laser hot key can easily switch the laser status between on and off. When the laser is off, the laser carriage would start to work without laser firing after pressing START/STOP key to better positioning the laser firing path. Once the position of laser firing is confirmed to be correct, then you can press the LASER key again to enable the laser, and start to laser engraving or cutting on materials.

Recall– The RECALL key makes the lens carriage applies the saved position as origin.

5.1.4 Graphic Control Panel Navigation Chart

Main Work Page

Functions Page

File Management Page | Machine Setting Page | Machine Information Page

Link / DLink Page

File Information Page

Red Beam

Vector Mode

Save Position

Carriage Free

Command Mode

File Save Mode

LAN Setup Wizard

SmartGUARD

Scaling

Other

Reset
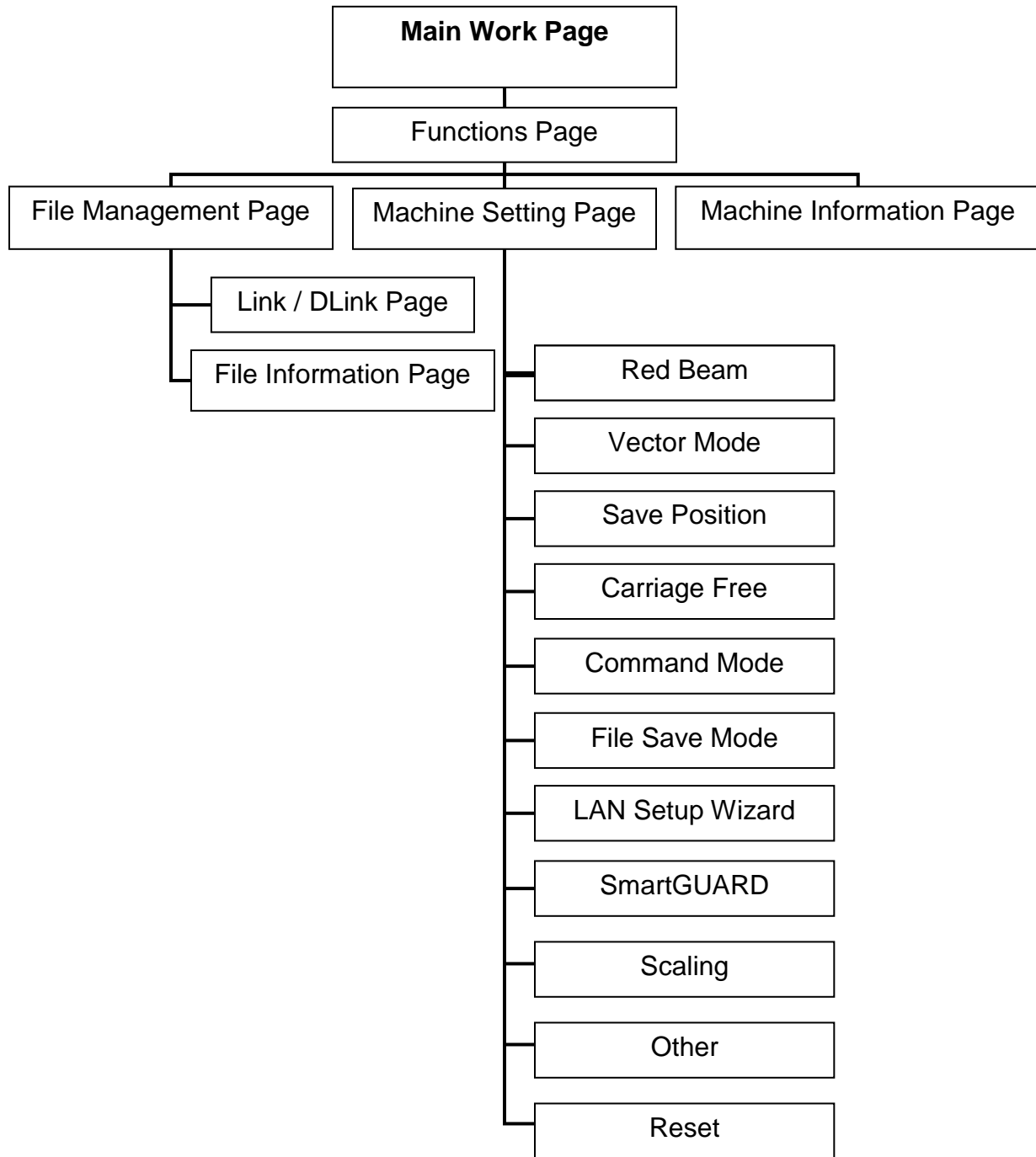
5.1.5 Graphic Control Panel Function Pages

When the LaserPro X500 SERIES is powered on, the machine will perform a series of safety checks and initializing routines. The LCD display screen will display the GCC copyright, LaserPro logo, and machine initialization pages before going to the main work page.

Main Work Page

The main work page is the page that the LaserPro X500 SERIES will default to upon startup and will be the "home base" for when navigating through the various functions of the control panel. This will be the page that is displayed when you are processing your jobs. This page contains specific job information such as the current job's name, Speed, Power, PPI, DPI, processing / remaining times, and jobs loaded.

Main Work Page	
Relevant Buttons	**Function**
F1 (Prev)	Scroll through previous jobs
F2 (Next)	Scroll through next jobs
F3 (Z)	Go to Carriage / Work Table Adjustment Page
F4 (Func)	Go to Functions Page
△ / ▽ / ◁ / ▷ Directional	Go to Carriage / Work Table Adjustment Page
Start / Stop	Start / Stop the current job
Delete	Delete the current selected job
Cutting Mode	Set Acceleration

Functions Page
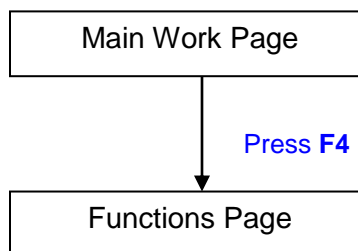
The Functions Page allows you to edit file management and machine settings. From this page, you will be able to access the File Management, Machine Setting, and Machine Information pages.

- **File Management Page** – this page allows you to manage the files that you have loaded onto the LaserPro X500 SERIES.
- **Machine Setting Page** – this page allows you to access and modify various machine settings, including: Set Lens, Set Table Down, Set Red Beam, Carriage Lock, Set Command Mode, Save Position, Flash Memory, Set File Save Mode, Set Vector Mode, Tune Image Power, Set Laser Wattage, Set Fine Mode, Other, Reset.
- **Machine Information Page** – this page allows you to view information regarding the system such as the GCC logo, machine name, firmware version, and other information.

Functions Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F3 (Help)	Display help
F4 (Recall)	Back to previous page
△ / ▽ Directional	Scroll through the menu selections
Enter	Perform the selection
Start / Stop	Back to Main Work Page

File Management Page

```
02|Marble.cdr
♦03|Marble.cdr
 01|Marble.cdr


Back Link D-All Del
```
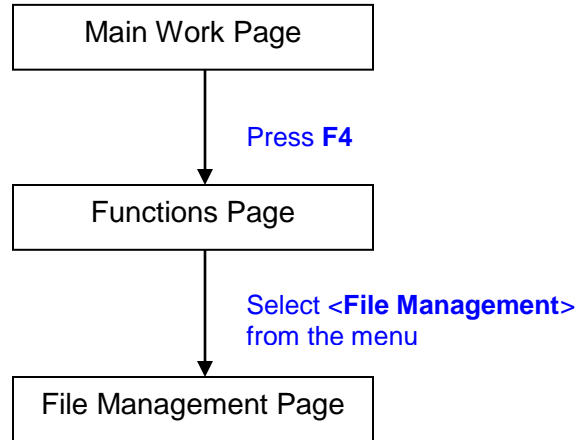
The File Management Page allows you to manage the files that you have loaded onto the LaserPro X500 SERIES. You can scroll through your jobs, delete a selected job, delete all jobs, and go to the Link/DLink Page to set and arrange multiple loaded jobs into a single job queue for processing.

File Management Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F2 (Link)	Go to the Link/DLink Page
F3 (D-All)	Delete all loaded jobs
F4 (Del)	Delete the selected job
△ **/** ▽ Directional	Scroll through your loaded jobs
Enter	Go to the File Information Page for the selected job
Start / Stop	Go to the Main Work Page for the selected job
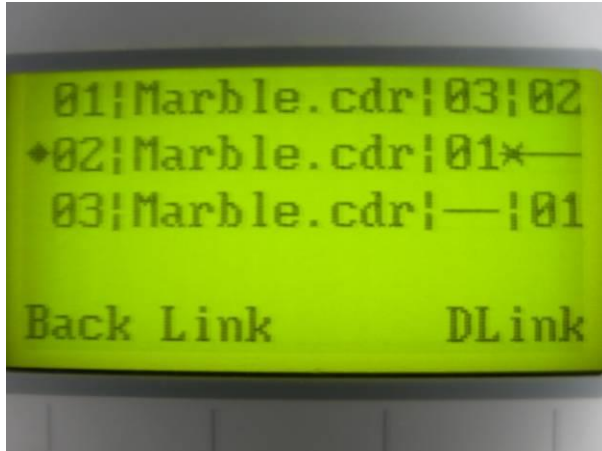
Link/DLink Page
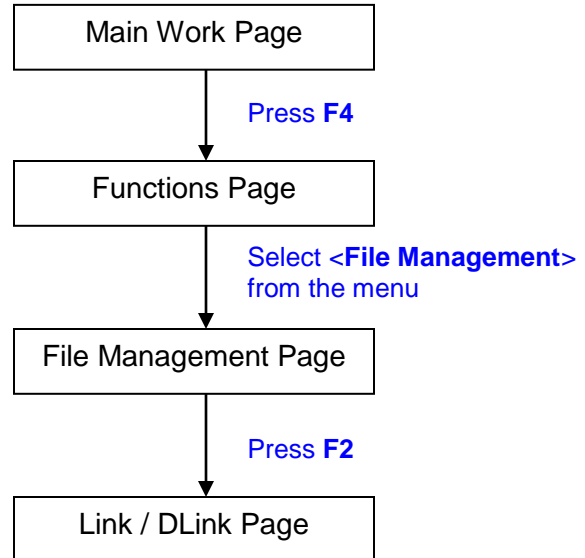
The Link/DLink Page allows you to set, arrange, and remove loaded jobs to and from a job queue for processing. Use the directional keys to cycle through your loaded jobs, then simply press the <F2 (Link)> key to add a file to the job queue. The job queue will be set in a sequential order based on the order you link the files. Press the <F4 (DLink)> key to remove a job from the job queue.

The first column field (before the file name) displays the job number. The sequence for your job queue is displayed in the two columns to the right of your file names. The first column to the right of your job file name displays the job number of the previous file in the job queue sequence. The second column after the file name displays that job's next file in the job queue sequence. First and last jobs in the job sequence you set will have a (---) in the first and second columns respectively. So according to the image above, the job queue sequence has been set to be processed in this order: 03:Marble.cdr → 01:Marble.cdr → 02:Marble.cdr.

Link/DLink Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F2 (Link)	Add the currently selected job to the job queue
F4 (DLink)	Remove the currently selected job from the job queue
△ / ▽ Directional	Scroll through your loaded jobs
Start / Stop	Back to Main Work Page

File Information Page

☼ **Navigating to this page:**

```
┌─────────────────────────┐
│    Main Work Page        │
└─────────────────────────┘
         │  Press F4
         ▼
┌─────────────────────────┐
│    Functions Page        │
└─────────────────────────┘
         │  Select <File Management>
         │  from the menu
         ▼
┌─────────────────────────┐
│  File Management Page    │
└─────────────────────────┘
         │  Select a job file and
         │  press Enter
         ▼
┌─────────────────────────┐
│  File Information Page   │
└─────────────────────────┘
```
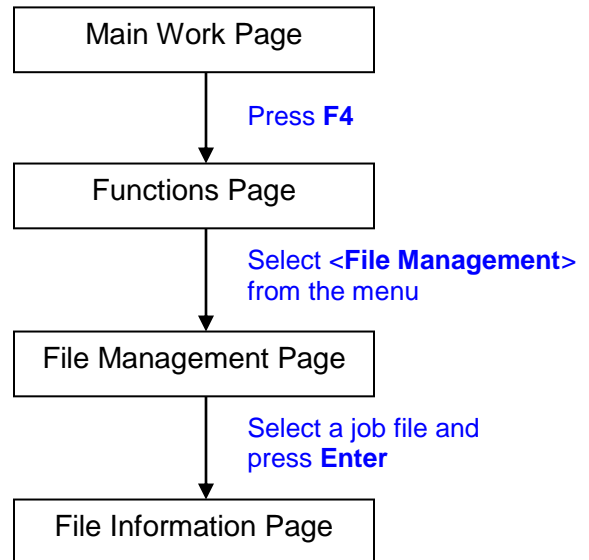
The File Information Page allows you to view the speed, power, DPI, and PPI settings of the selected job. In addition, you will be able to go to the File Management Edit Page from this menu to change raster / vector speed and power settings for the selected job.

File Information Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Edit)	Go to the File Management Edit Page for the selected job
Start / Stop	Back to Main Work Page

File Edit Vector Page

Main Work Page

Press **F4**

Functions Page

Select <**File Management**> from the menu

File Management Page

Select a job file and press **Enter**

File Information Page

Press **F4**

File Management Edit Page

Select <**Vector Setting**> from the menu

File Edit Vector Page
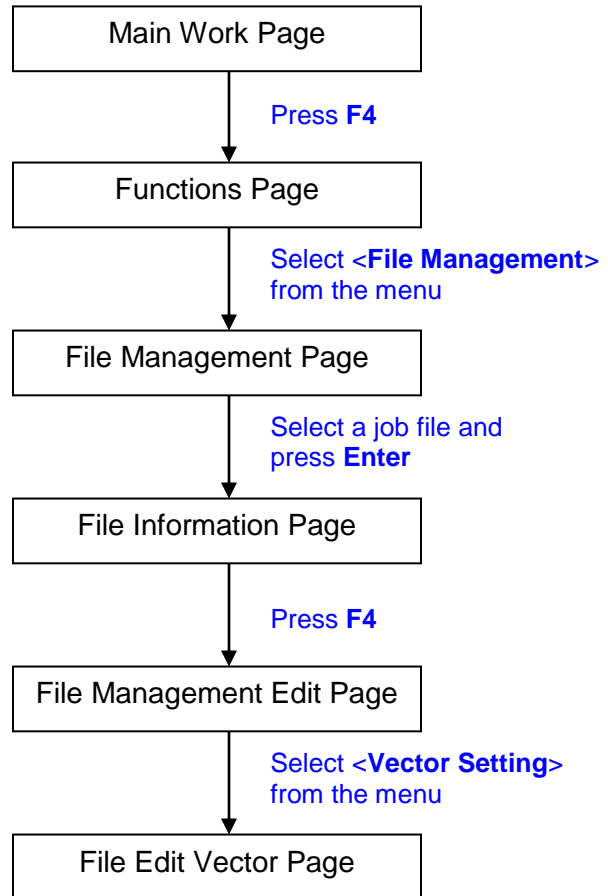
The File Edit Vector Page allows you to edit the vector pen, vector power, vector speed, and vector PPI, and power ramp settings for the selected job. These settings correspond to the same settings found on the LaserPro X500 SERIES print driver. This page allows you to easily adjust these values to make immediate adjustments while processing your loaded jobs, even when you have disconnected your computer from the LaserPro X500 SERIES.
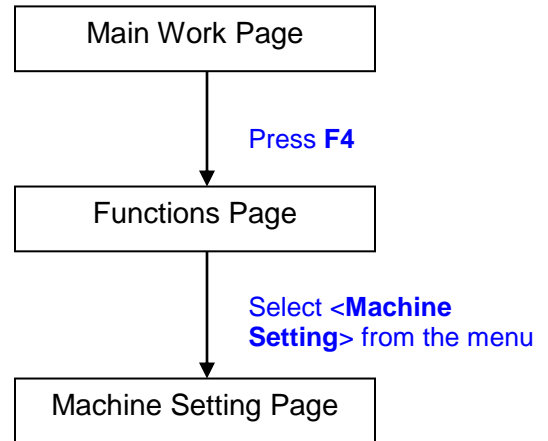
- Vector Pen: 1 - 16
- Vector Power: 0.0% - 100%
- Vector Speed: 0.0% 100%
- Vector PPI: 30 - 1524
- Power Ramp: YES / NO

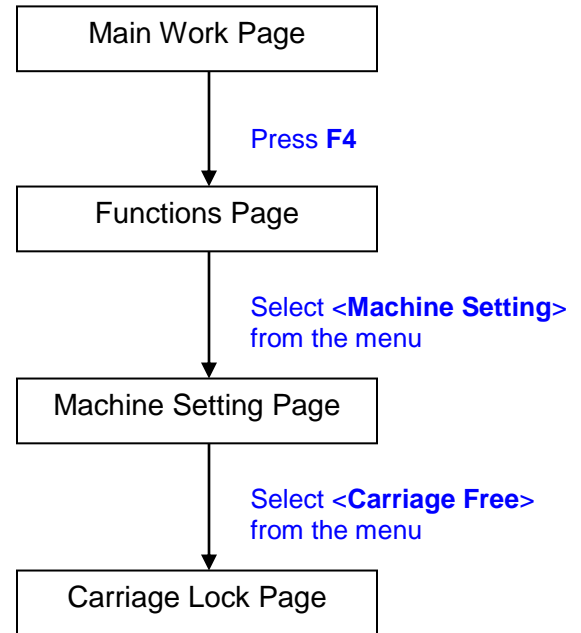| File Edit Vector Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
△ / ▽ Directional	Scroll through the menu selections
◁ / ▷ Directional	Adjust the value for that selection
Start / Stop	Back to Main Work Page
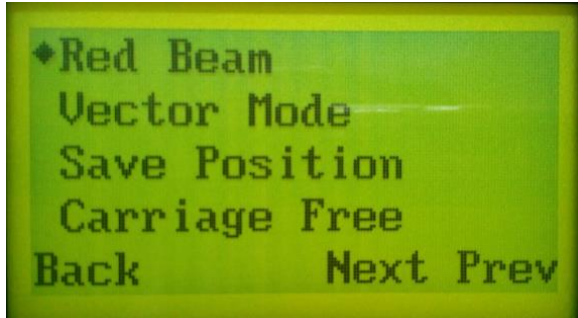
Machine Setting Page

The Machine Setting Page allows you to access and modify a variety of your machine settings, including: Set Lens, Set Red Beam, Carriage Free, Set Command Mode, Save Position, Set File Save Mode, Set Vector Mode, Set Laser Wattage, Other, and Reset.

Machine Setting Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
△ / ▽ Directional	Scroll through the menu selections
Enter	Perform the selection
Start / Stop	Back to Main Work Page

Carriage Free Page

☼ **Navigating to this page:**

```
┌─────────────────────────┐
│     Main Work Page      │
└─────────────────────────┘
            │
            ▼  Press **F4**
┌─────────────────────────┐
│     Functions Page      │
└─────────────────────────┘
            │
            │  Select <**Machine Setting**>
            ▼  from the menu
┌─────────────────────────┐
│   Machine Setting Page  │
└─────────────────────────┘
            │
            │  Select <**Carriage Free**>
            ▼  from the menu
┌─────────────────────────┐
│    Carriage Lock Page   │
└─────────────────────────┘
```

The Carriage Free Page allows you to set whether the laser carriage is locked or free. If the Carriage Free setting is set to <YES>, then you will be able to manually move the laser carriage along the X and Y axis by hand with the top door open. Whereas setting the Carriage Free to <NO> will lock the laser carriage, and movement or positioning can only be done by the control panel.
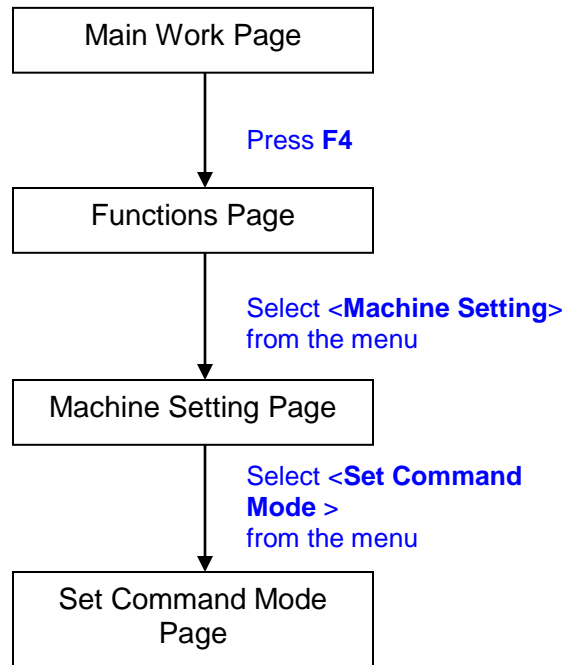
- Carriage Free YES / NO

| Carriage Free Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
◁ **/** ▷ Directional	Cycle Carriage Free between YES / NO
Start / Stop	Back to Main Work Page

Set Command Mode Page

The Set Command Mode Page allows you to configure vector settings when outputting in Default or HPGL mode. Default mode is the standard Windows print driver recognized by the most popular graphic software programs, such as CorelDraw, Photoshop, Illustrator, etc. Whereas, HPGL mode is a less common output format generated from some RIP applications (signage industry). Regardless of which format you will be working with, both output formats are supported.
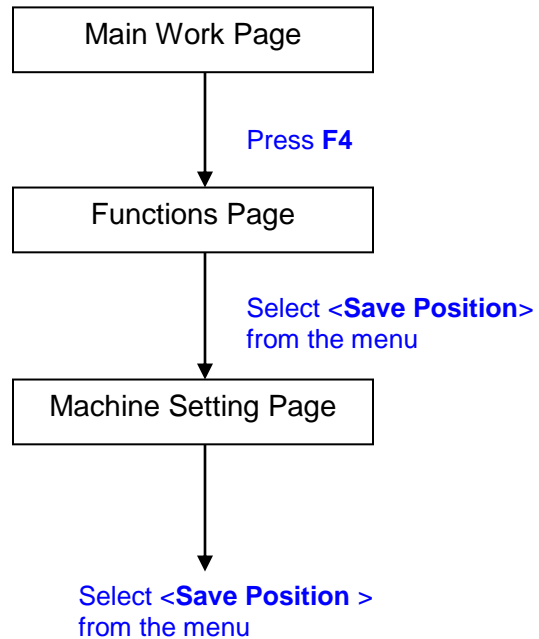
- Mode: Default / HPGL
- Vector Pen: 1 - 16
- Vector Speed: 0.0% - 100%
- Vector PPI: 0.0% - 100%
- Power Ramp: YES / NO

| Set Command Mode Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
△ / ▽ Directional	Scroll through the menu selections
◁ / ▷ Directional	Adjust the value for that selection
Start / Stop	Back to Main Work Page
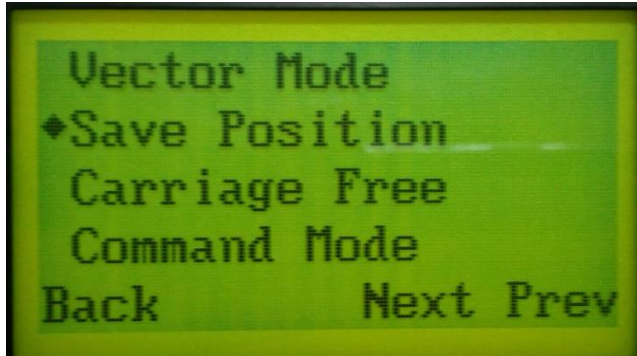
Save Position Page

The Save Position Function allows you to save the current X-axis and Y-axis positions of the laser carriage and sets this position to be the origin for subsequent jobs.

> **TIP**
> This is an excellent function to use when you are processing identical items or engraving relatively smaller objects positioned away from the default start position (top left) of the work table.
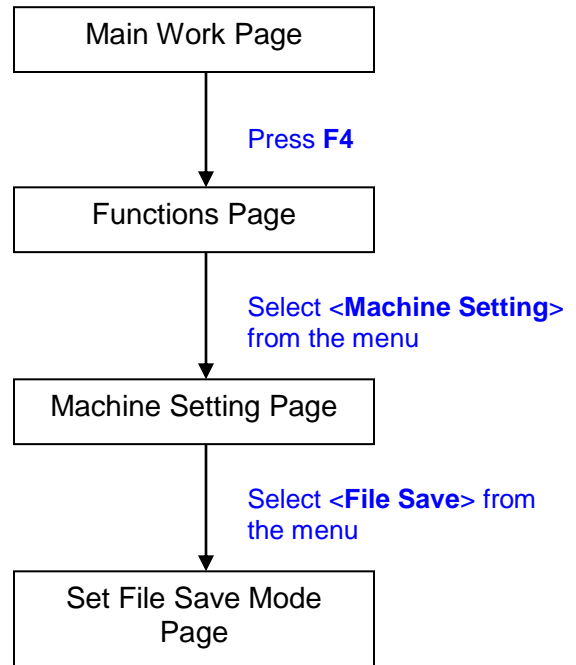
Recall Position
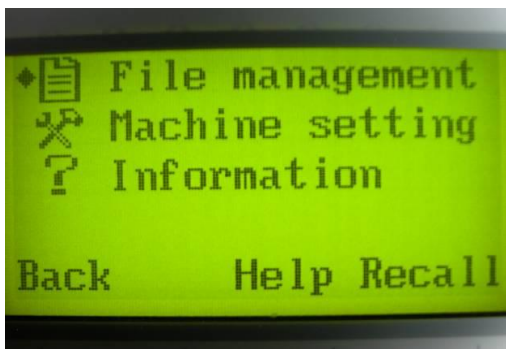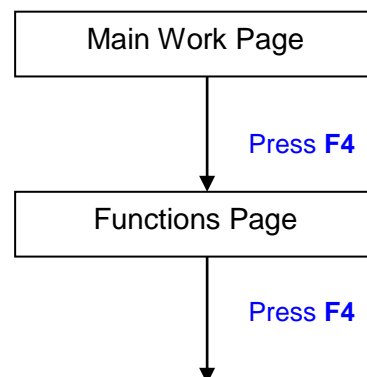
To recall the saved position, simply go to Functions page and press F4 again to recall the saved position. The lens carriage will be moved to the saved position and start subsequent jobs from this origin.

File Save Page

The Set File Save Page allows you to set whether or not the LaserPro X500 SERIES automatically deletes each job file after processing. Setting File Save to <NO> will automatically and immediately delete each job file from the LaserPro X500 SERIES after the engraving or cutting process. Setting File Save to <YES> will retain all job files on the LaserPro X500 SERIES, even after each job has been processed.

- File Save: YES / NO

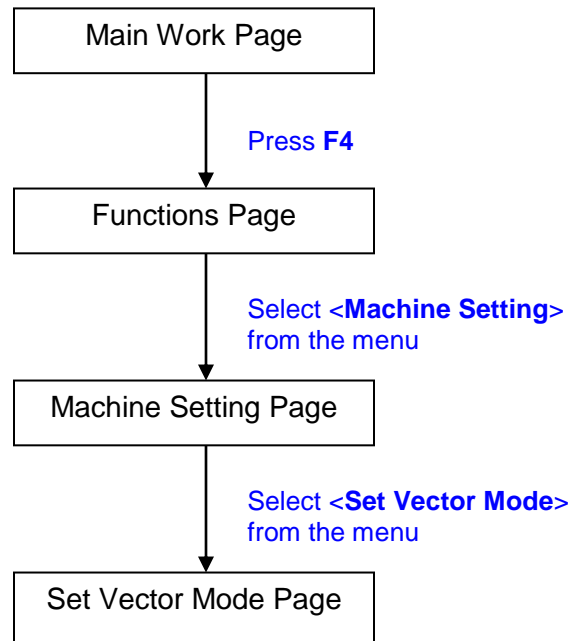| File Save Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
◁ / ▷ Directional	Cycle File Save between YES / NO
Start / Stop	Back to Main Work Page

Set Vector Mode Page

☼ **Navigating to this page:**

```
┌─────────────────────┐
│   Main Work Page     │
└─────────────────────┘
          │
       Press F4
          │
          ▼
┌─────────────────────┐
│   Functions Page     │
└─────────────────────┘
          │
       Select <Machine Setting>
       from the menu
          │
          ▼
┌─────────────────────┐
│ Machine Setting Page │
└─────────────────────┘
          │
       Select <Set Vector Mode>
       from the menu
          │
          ▼
┌─────────────────────┐
│  Set Vector Mode Page│
└─────────────────────┘
```
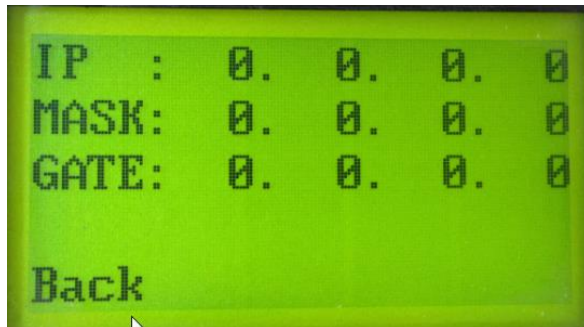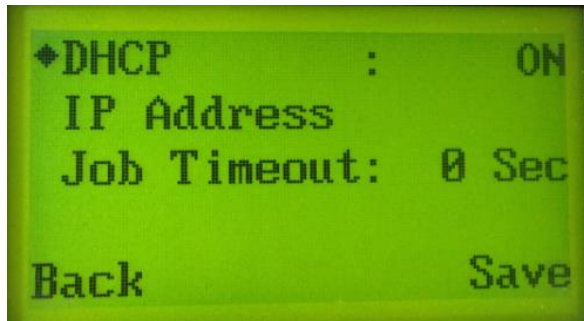
The Set Vector Mode Page allows you to adjust and balance vector mode's quality and speed settings based on your specific job. Speedy Vector Mode offers the highest output speed, sacrificing quality. Whereas Quality Vector Mode offers the highest quality, sacrificing output speed. Keep in mind that speed and quality are usually at a tradeoff. The system's default is Production Vector mode.

- Modes: Quality, Production, Speedy
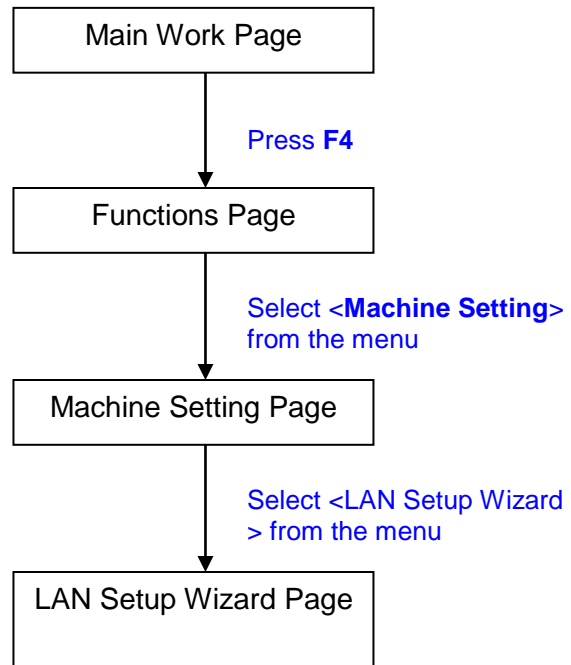 (Slower speeds / higher quality -------------------- Faster speeds / lower quality)

The machine will reboot automatically once clicking <Save> button for the change.

Vector Mode Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
◁ / ▷ Directional	Cycle Set Vector Mode between QUALITY VECTOR/ PRODUCTION VECTOR /SPEEDY VECTOR
Start / Stop	Back to Main Work Page

LAN Setup Wizard Page

```
┌─────────────────────────┐
│     Main Work Page      │
└─────────────────────────┘
           │
           │   Press **F4**
           ▼
┌─────────────────────────┐
│     Functions Page      │
└─────────────────────────┘
           │
           │   Select <**Machine Setting**>
           │   from the menu
           ▼
┌─────────────────────────┐
│  Machine Setting Page   │
└─────────────────────────┘
           │
           │   Select <LAN Setup Wizard
           │   > from the menu
           ▼
┌─────────────────────────┐
│  LAN Setup Wizard Page  │
└─────────────────────────┘
```
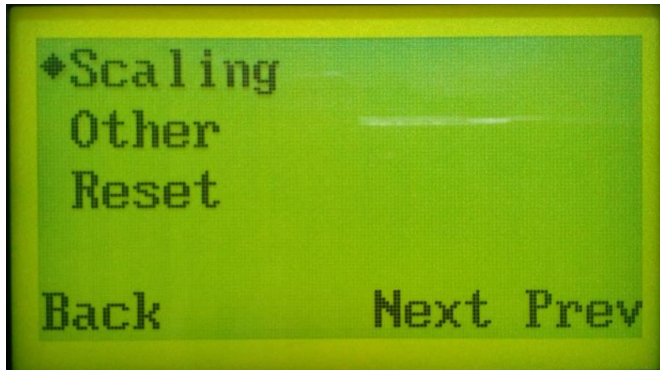
The LAN Setup Wizard Page allows you to connect the laser machine with ethernet to transmit files from computer to laser machine for processing jobs. When selecting the DHCP to <ON>, the network is set tup to dynamic IP address, the IP address will automatically retrieve from network; while DHCP <OFF> is to apply static IP address, and you need to further enter the IP address, MASK, and GATE information. Using Left or Right directional keys under dynamic IP setting page to scroll between different columns to enter the address, and use Up or Down keys to change the numbers.
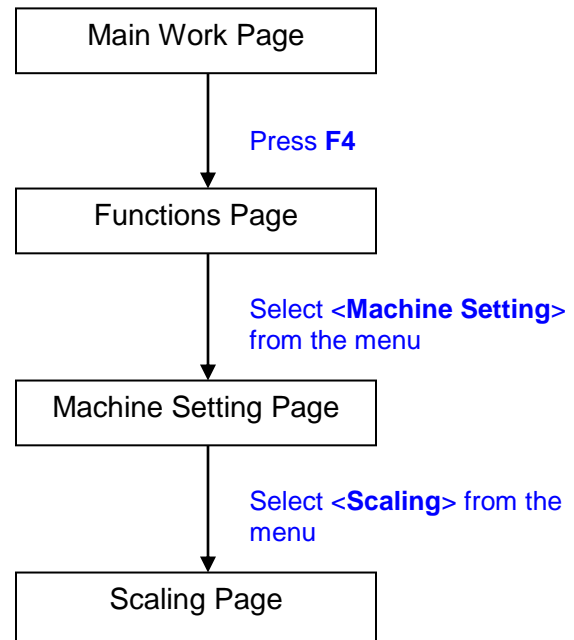
• DHCP: NO/ OFF

Please refer to Chapter 4.1.3 for ethernet connectivity setup in Windows driver.

LAN Setup Wizard Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
◁ **/** ▷ Directional	Cycle DHCP between NO/ OFF, or move between tabs on IP address settings
△ / ▽ Directional	Scroll between menu options, or change the numbers of IP address settings.
Start / Stop	Back to Main Work Page

Scaling Page

```
Main Work Page
        |
    Press F4
        v
Functions Page
        |
Select <Machine Setting>
from the menu
        v
Machine Setting Page
        |
Select <Scaling> from the
menu
        v
Scaling Page
```

The Scaling Page allows you to fine tune the laser machine output scale to precisely fit the original graphic file design scale when precision output is requried to your application.

Remember to reboot the machine once the scaling value is changed.

Scaling Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
◁ / ▷ Directional	Adjust the X axis scaling numbers
△ / ▽ Directional	Adjust the Y axis scaling numbers
Start / Stop	Back to Main Work Page
Auto Focus	Initiate the auto focus function
▲ / ▼ Manual Focus Buttons	Manually adjust the height of the work table (Z-axis)

SmartGUARD Page


```
Main Work Page
```

```
Functions Page
```

```
Machine Setting Page
```

```
SmartGUARD Page
```
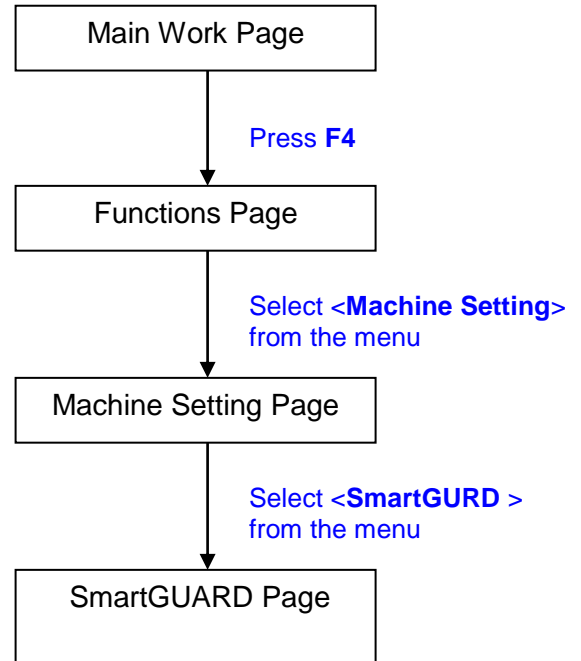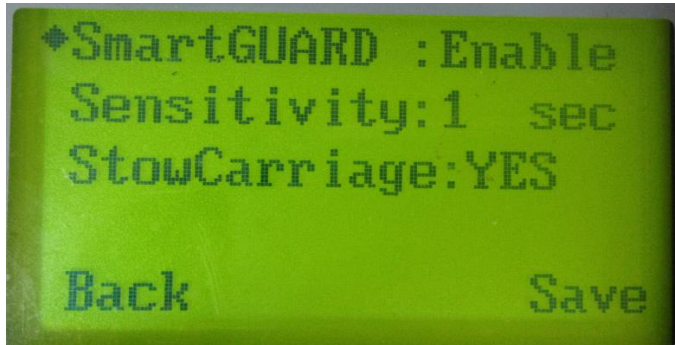
After optional SmartGUARD hardware installation, please enter the function menu on the control panel to enable the SmartGUARD fire alarm. Note SmartGUARD fire alarm system is not a fire extinguisher, but a fire detecting and alarm system.

SmartGUARD Enable/ Disable:

Press directional key (Left or Right) to enable the SmartGUARD device or disable it.

Sensitivity：

Press directional key (left or right) to set the sensitivity of SmartGUARD. There are five sensitivity settings (1, 3, 5, 7, 9 seconds) that can be selected. Sensitivity defines the delay time from when a fire is detected until the fire alarm alerts user, and automatically stop laser firing. For example, if the sensor delay switch is set to the 3-second position, the SmartGUARD will start an alarm and automatically stop laser firing after detecting a fire for 3 seconds.
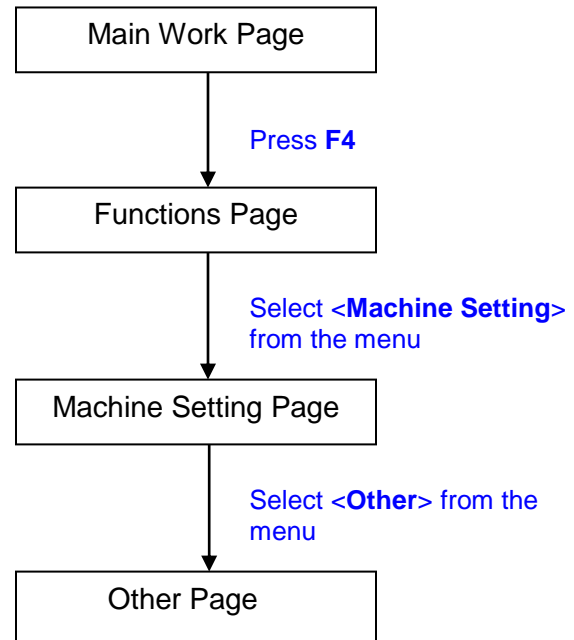
Stow Carriage：

This function will decide if the lens carriage stay in the last position (set to <NO>) or move to the opposite direction (up or down) when fire alarm is initiated. The default is <YES>, the lens carriage will move to opposite direction when a fire detected.

SmartGUARD Setting Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
◁ **/** ▷ Directional	Cycle SmartGUARD between Disable/ Enable
△ **/** ▽ Directional	Scroll through the menu selections
Start / Stop	Back to Main Work Page
Auto Focus	Initiate the auto focus function
▲ / ▼ Manual Focus	Manually adjust the height of the work table (Z-axis)

Other Page

Main Work Page

Press **F4**

Functions Page

Select <**Machine Setting**> from the menu

Machine Setting Page

Select <**Other**> from the menu

Other Page

The Other Page allows you to change various settings that correspond to the control panel. The Language setting will allow users to change available languages displayed by the control panel. The Unit setting will allow you to change whether the units displayed by the control panel is in the metric or imperial system. The EOF (end of file) Alarm setting will enable or disable an audible notification when your jobs are complete. The Air Delay setting allows you to specify the delay in seconds of the SmartAIR air-assist after the point of laser firing.

- Language: ENGLISH (others dependent on Firmware)
- Unit: METRIC / ENGLISH
- EOF Alarm: YES / NO
- Air Delay: 1-100 seconds

TIP
Depending on the material you are engraving with, your laser settings, and the desired results, please experiment with the air delay to achieve your desired results.

Other Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
F4 (Save)	Save your current settings
△ / ▽ Directional	Scroll through the menu selections
◁ / ▷ Directional	Adjust the value for that selection
Start / Stop	Back to Main Work Page

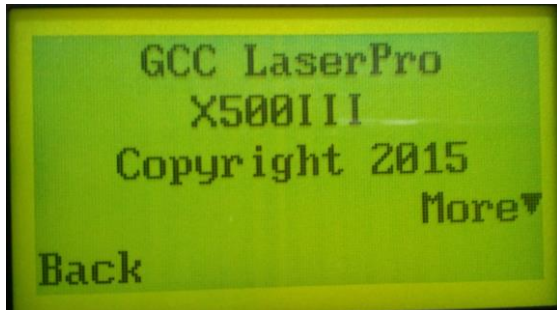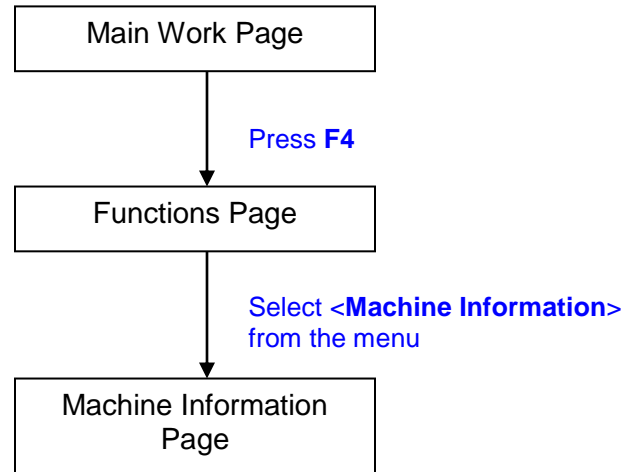**Reset Page**
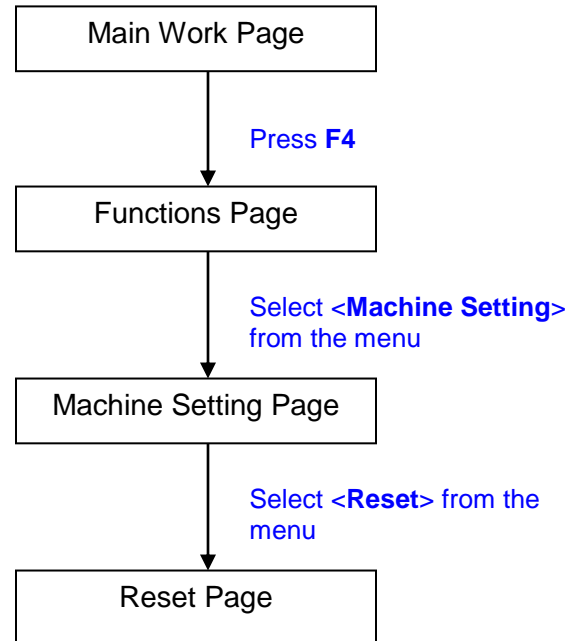
The Reset Page will restore machine settings back to factory default. Press ENTER to confirm the change, and restart the machine.

Reset Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
△ / ▽ Directional	Scroll through the menu selections
Enter	Perform the selection
Start / Stop	Back to Main Work Page

Machine Information Page

The Machine Information Page allows you to view information regarding the system such as the GCC logo, machine name, firmware version, and other information.

Machine Information Page	
Relevant Buttons	**Function**
F1 (Back)	Back to previous page
△ / ▽ Directional	Scroll through pages
Start / Stop	Back to Main Work Page

5.2 The LaserPro X500 SERIES Print Driver

With the LaserPro X500 SERIES print driver successfully installed, you will need to adjust the printer and page size default settings before you can begin editing and completing jobs. By doing so, you will be setting the work area in your graphics software to match the LaserPro X500 SERIES's worktable area.

> ℹ️ **NOTE**
> Please make sure the LaserPro X500 SERIES is set as the default printer before proceeding to the page and layout setup.

Ensure that the LaserPro X500 SERIES has been selected as the DEFAULT PRINTER. You can do so by going into your Windows Control Panel → Printers and Faxes.

If LaserPro X500 SERIES is not selected as DEFAULT PRINTER, you may set it up through the graphics software as well. The following example takes Corel Draw to demonstrate how to set up LaserPro X500 SERIES as the Printer.

1)   From the primary menu, click FILE → PRINT SETUP.
2)   From the navigation bar Name, select LaserPro X500 SERIES → OK
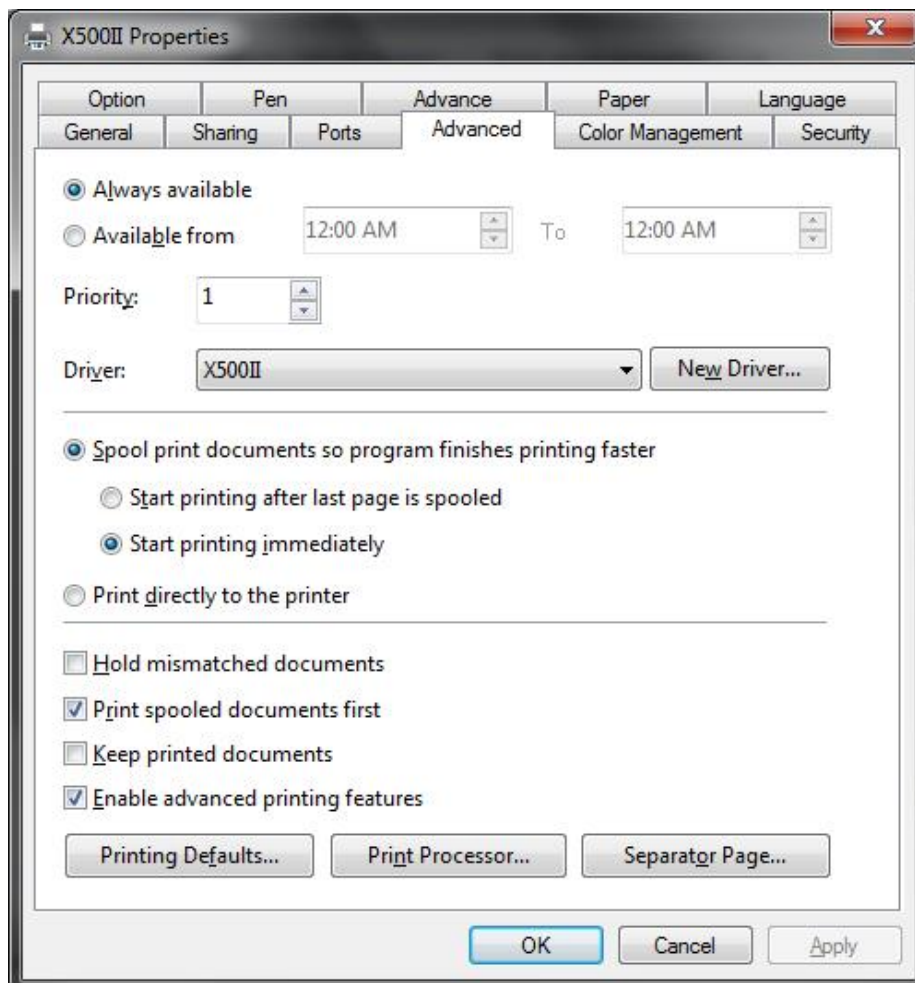
5.2.1 Page Setup and Orientation

The first thing you must do before working with the LaserPro X500 SERIES Print Driver will be to make sure the page and layout settings are properly configured within your graphics software. You will need to access and edit the Page Setup or Layout page of your graphics software to set your graphics software's page layout to match the LaserPro X500 SERIES's work table's dimensions and orientation.

From your graphic software's Page Setup page:

- Set the page orientation in the graphics software to Landscape mode.

- Set page size horizontal length to 1300 mm (51.1 inches) and vertical height to 916 mm (36.1 inches).

Corel Draw Example (Page Setup and Orientation)

The following is an example of how to set the Page Setup and Orientation in the graphics software. CorelDraw is the designated graphics software used for this example. For other graphics software, you will need to access the corresponding Page Setup page.

1) From the primary menu, click LAYOUT → PAGE SETUP.

2) From the navigation bar on the left, click DOCUMENT → PAGE → SIZE.

3) Ensure that NORMAL PAPER and LANDSCAPE are selected.

4) Ensure the Paper Width and Height dimensions match the LaserPro X500 SERIES's work table dimensions of 1300 mm (51.1 inches) and 916 mm (36.1 inches).

5) Click OK to complete the paper size adjustment.

> *TIP*
> Instead of manually selecting the Landscape and setting the Paper Width and Height, you can simply click the Set From Printer function and CorelDraw will automatically set the proper orientation and dimensions based on LaserPro X500 SERIES's work table. (You MUST have the LaserPro X500 SERIES set as the default printer prior to doing this.)
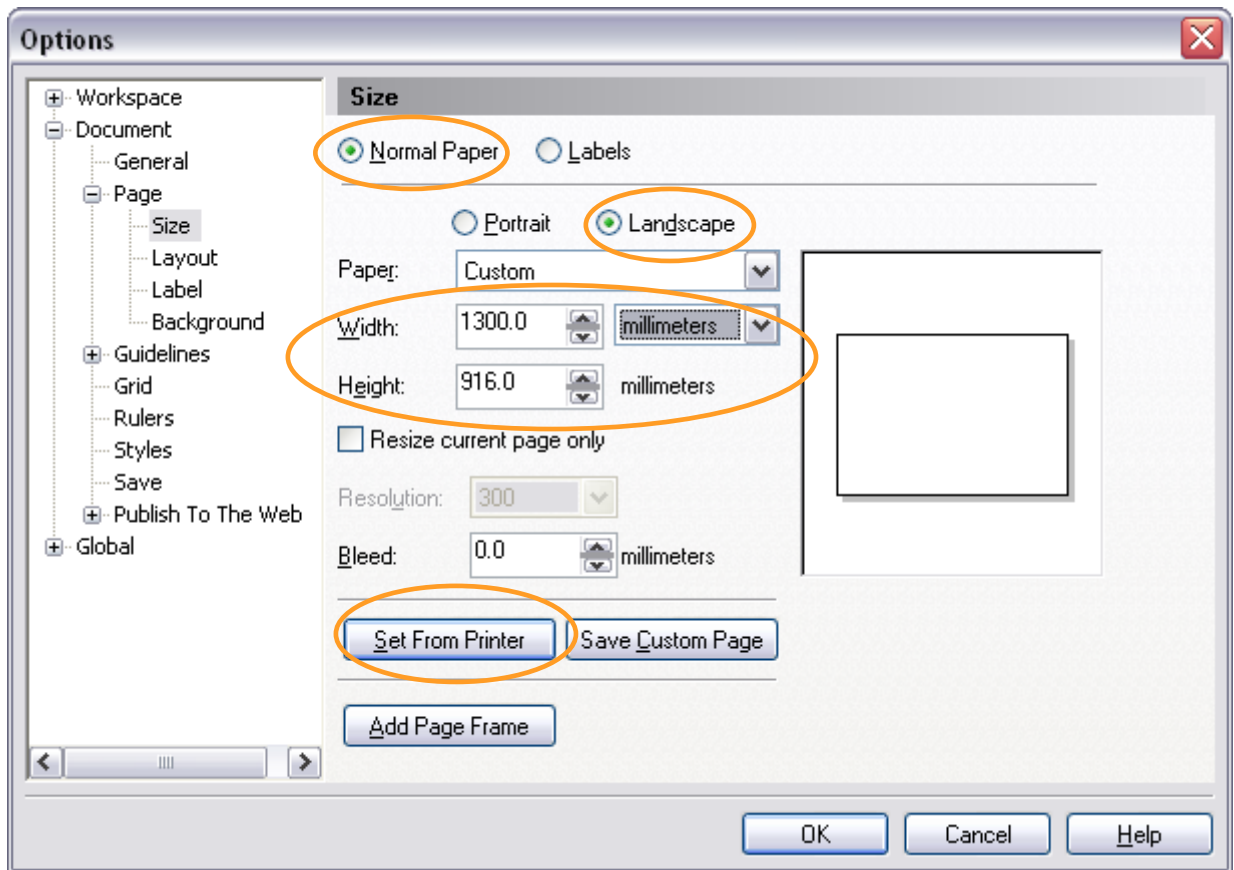
5.2.2 Color Management

LaserPro driver uses pen color settings to control laser engraver's engraving and cutting parameters. In addition to having your Page Setup and Orientation properly set in your graphics software, you will also need to make sure Color Management is DISABLED prior to working with the LaserPro X500 SERIES Print Driver.
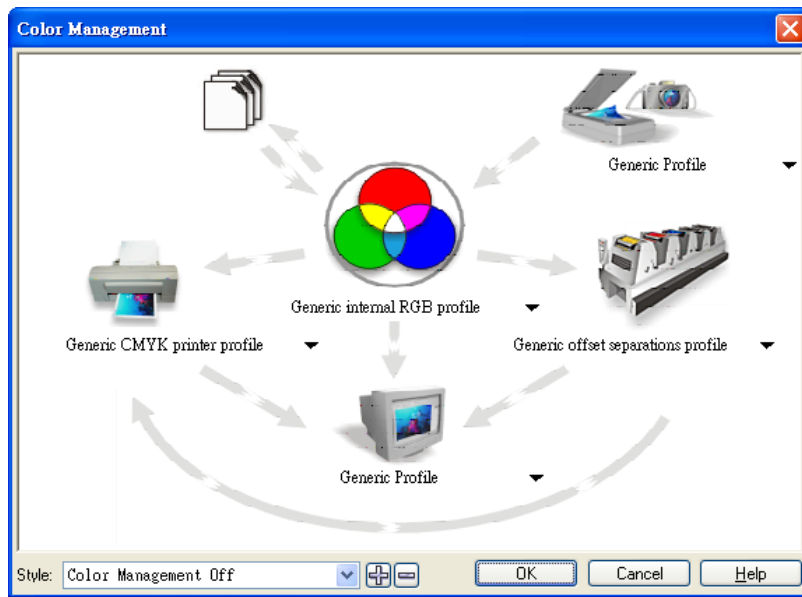
From your graphic software's Color Management page:

- Disable Color Management or set Color Management to Off.

Corel Draw Example (Color Management)

The following is an example of how to properly disable Color Management in the graphics software. CorelDraw is the designated graphics software used for this example. For other graphics software, you will need to access the corresponding Color Management page.

1) From the primary menu, click TOOLS → COLOR MANAGEMENT and CorelDraw's Color Management will appear.

2) Under the Style pull down menu, select COLOR MANAGEMENT OFF.

3)   Click OK to complete the color management adjustments.

5.2.3 Using the LaserPro X500 SERIES Print Driver

Now after you have properly set the Page and Layout and Color Management of your graphics software, you are ready to configure the details of your actual job through the LaserPro X500 SERIES Print Driver. The LaserPro X500 SERIES print driver allows you to adjust your engraving / cutting options. After you have setup your image, design, or text to be engraved in your software application, you can access the LaserPro X500 SERIES print driver by going to FILE → PRINT → PREFERENCES.
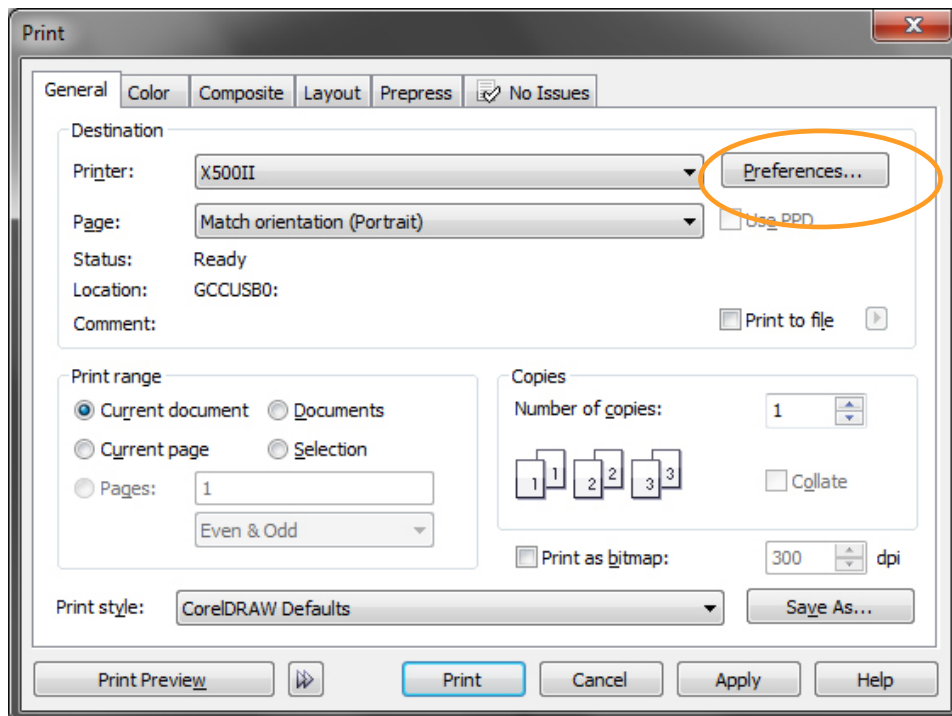
> **ⓘ Note**
> For this screenshot example, CorelDraw was used as the software application.

The LaserPro X500 SERIES Driver consists of five primary sections (pages) in which you will be able to choose various engraving / cutting options and settings:

- Option Page
- Pen Page
- Advance Page
- Paper Page
- Language Page

> **TIP**
> The following sections describe the specific functions for each of the settings found in the LaserPro X500 SERIES Print Driver. If you are new to laser engraving, it is recommended that you first familiarize yourself with the general principles of the laser process in Section 6, especially the Vector Cutting and Raster Engraving concepts. This will make it easier to understand the various descriptions and terminologies used in this section.

5.2.3.1 LaserPro X500 SERIES Print Driver >> Option Page
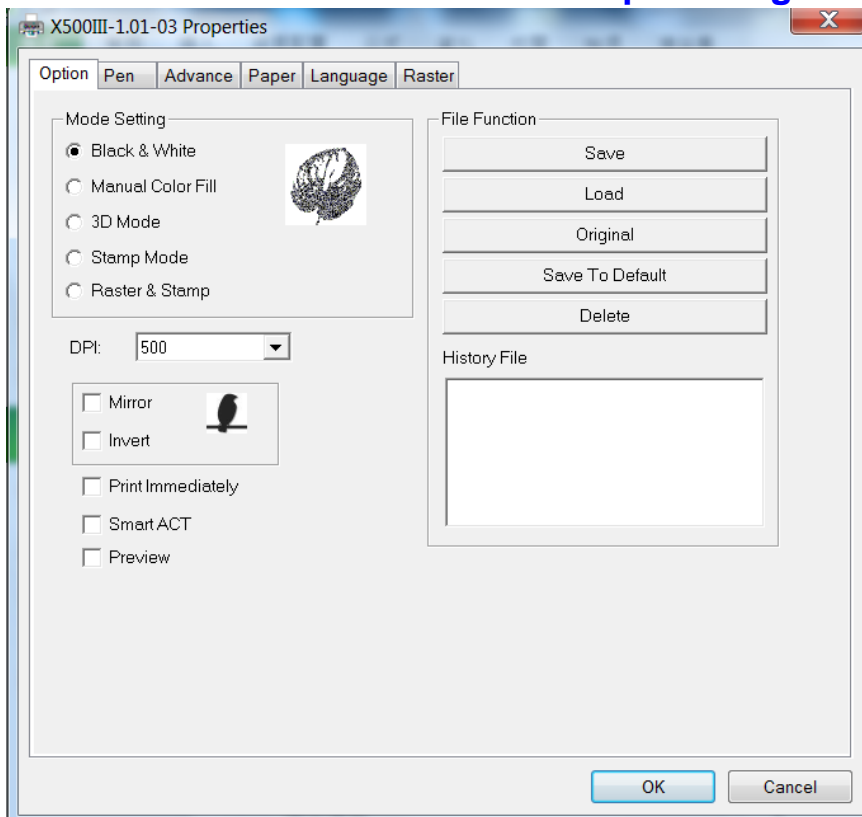
Mode Setting (OPTION PAGE) [DEFAULT SETTING: Black & White]

Black & White: Select this mode when using clipart images or drawings with several colors, shades of gray, or many outlines. This mode outputs in a method similar to that of a black and white laser printer.

The GCC LaserPro print driver will interpret colored and shaded areas as 256-level shades of gray by producing a halftone effect while engraving. Instead of engraving only solid lines, gray or halftone areas will be a collection of dots with varying density.

The entire selected image will be engraved using a single set of power and speed settings (the black pen from the PEN menu. Please refer to the next section of the details regarding the PEN functions). The resolution and depth of these halftone areas can be adjusted with the DPI setting found on the Options page. Please note that selecting the Black & White mode will add a new Raster page to the menu. The Black & White mode dithering settings can be changed from the Raster page. (Please refer to the Raster section below for details). Experiment with different dithering settings to attain the desired results.

> **TIP**
> The Black & White mode interprets the processed image by the varying colors and shades. For the best results, we suggest you convert the image to a grayscale image with your graphics software prior to engraving in the Black & White mode.

> **NOTE**
> Selecting the Black & White mode will enable the Raster page on the LaserPro X500 series Print Driver, allowing you to adjust advanced stamp-related settings.

Manual Color Fill

Specify laser type to different color pens. The GCC LaserPro print driver allows a maximum of 16 pen parameters to be set. It will help user to set different parameters easily in one file.

Pen No.	Color	Speed	Power	PPI	Raster	Vector	Air	AF	Defocus	Bridge	Repeat
1		50.0	50	400	YES	YES	NO	NO	0.0	5	1
2		50.0	50	400	YES	YES	NO	NO	0.0	0	1
3		50.0	50	400	YES	YES	NO	NO	0.0	0	1
4		50.0	50	400	YES	YES	NO	NO	0.0	0	1
5		50.0	50	400	YES	YES	NO	NO	0.0	0	1
6		50.0	50	400	YES	YES	NO	NO	0.0	0	1
7		50.0	50	400	YES	YES	NO	NO	0.0	0	1
8		50.0	50	400	YES	YES	NO	NO	0.0	0	1
1*		50.0	50	400	YES	YES	NO	NO	0.0	1	1
10		50.0	50	400	YES	YES	NO	NO	0.0	0	1
11		50.0	50	400	YES	YES	NO	NO	0.0	0	1
12		50.0	50	400	YES	YES	NO	NO	0.0	0	1

Speed: ‹ ———————— › 50.0 ☑ Raster
Power: ‹ ———————— › 50 ☑ Vector
PPI: ‹ ———————— › 400 ☐ Air
Defocus ‹ ———————— › 0.0 mm ☐ Auto Focus
Bridge : ‹ ———————— › 0 mm ☐ Defocus
  ☐ Bridge Cutting
  Repeat: 1

3D Mode: 3D Mode allows the naked eyes to visualize the curvatures of the 3D effect by applying 200 grayscale power level technology to create different depth of engraving.
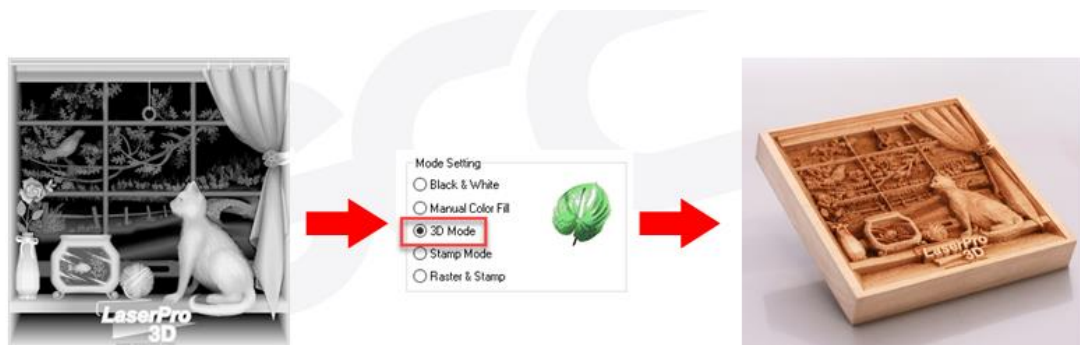
Stamp Mode: The stamp mode is one of the more dynamic functions of the LaserPro laser engravers by applying 200 power leve to create different steps.
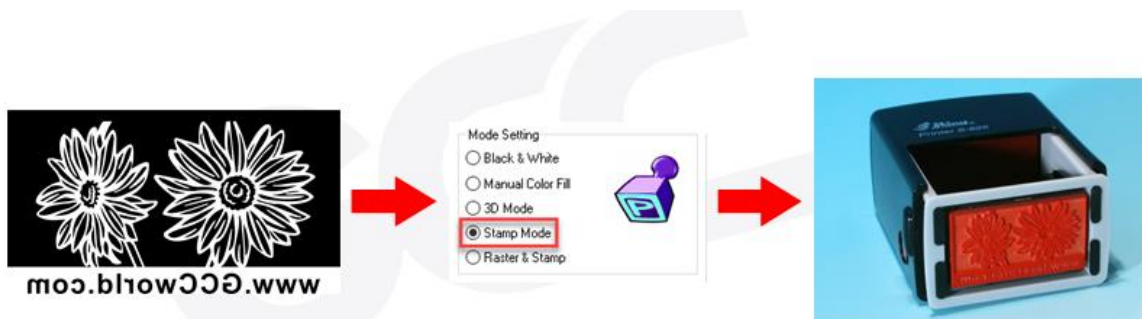
> ℹ️ **NOTE**
> Selecting the Stamp mode will enable the Stamp page on the X500 Print Driver, allowing you to adjust advanced stamp-related settings.

Raster & Stamp Mode: Select this mode when you would like to engrave image on stamps. The Raster & Stamp mode combines the 256 level gray scale image processing technology and 200 power level stamp steps production requirement to create slopes.

DPI (Option Page) [DEFAULT SETTING: 500]

DPI (dots-per-inch) represents the number of times the laser will fire over a one-inch path. This setting determines the image resolution and quality when performing raster engraving functions. Higher DPI settings result in cleaner and deeper engravings, but require more time to complete. Lower DPI settings result in coarser and shallower engravings, but require less time to complete. The LaserPro X500 SERIES offers 8 DPI options: 125, 250, 300, 500, 600 and 1000, experiment with different settings to get your desired effect.

Below is a chart for your convenience detailing the Set DPI (your input setting) vs. Actual DPI (your output results).

DPI Setting	125	250	300 *	500	600 *	1000
Actual DPI	127	254	381	508	762	1016

> ⓘ **NOTE**
> Outputting a full-table job using 300 or 600 DPI will result in a truncation error; this is due to the large differences in set DPI vs. actual DPI output for those two particular DPI settings. Therefore, when processing a full-table job using 300 DPI, we recommend you move to the next higher DPI setting of 380. Similarly, for a full-table job using 600 DPI, we recommend you use 760 DPI.

Mirror (Options Page) [DEFAULT SETTING: Unselected]

Checking this box will automatically engrave your image with a mirrored effect. This setting will flip the image along the Y-axis from left to right and vice-versa.

> 💡 **TIP**
> When engraving a stamp, via the stamp mode, the stamp image needs to be engraved in reverse (mirrored) for the final stamp to be correctly laid out.

Invert (Options Page) [DEFAULT SETTING: Unselected]

Checking this box automatically inverts / reverses the color of your image (the white areas become black and vice versa). The Invert option is not available if disabled while Manual Color File mode is selected.

> **TIP**
> Invert mode is useful when creating a stamp in Stamp Mode, as inverting your normal image will set the negative space to be engraved out, with the remaining positive space (your stamp design) protruding out.
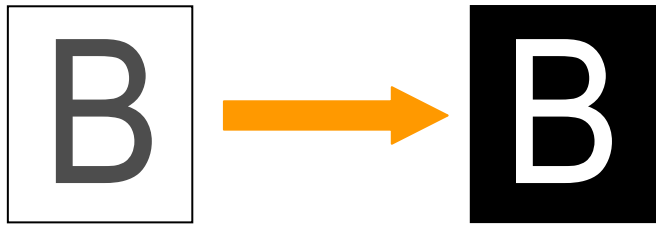

Print Immediately (Options Page) [DEFAULT SETTING: Unselected]

Checking this will instruct the LaserPro X500 series to immediately begin the laser engraving process, when you select Print from your graphic software program. If Print Immediately is not checked, then selecting Print will transfer the job file to the LaserPro X500 Series system and will need to be initialized from the LaserPro Spirit Series control panel.

SmartACT (Options Page) [DEFAULT SETTING: Unselected]

By eliminating unnecessary travel of the lens carriage at the expense of some quality, SmartACT reduces the acceleration area to save of time to process a job~!
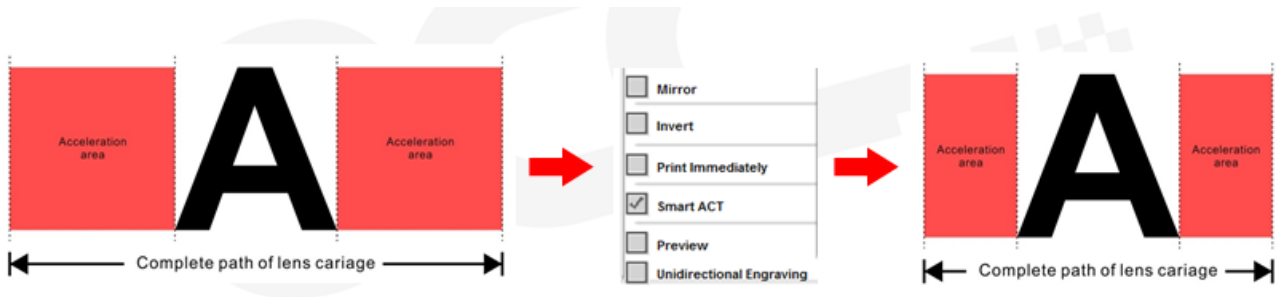

> **TIP**
> There is a greater performance gain when enabling SmartACT for designs that are vertically longer than they are horizontally wide, as the SmartACT optimization modifies the movement of the X-axis of the laser carriage.

**Preview (Options Page)** [DEFAULT SETTING: Unselected]

Users can use the Preview function to check a simulated output of the job. An estimated working time will also be shown. Please make sure to set the file printing option to "print to file" in order to activate the Preview function.

Below use GCC Spirit LS driver as illustration. The operation procedure is identical, make sure choose the right printer name from the menu.
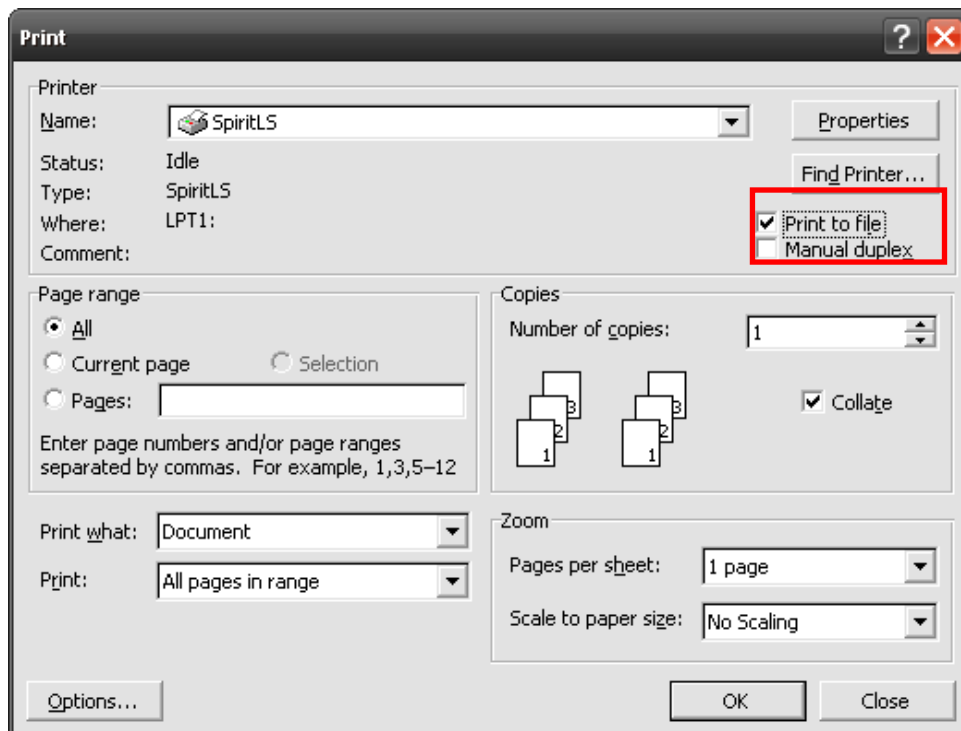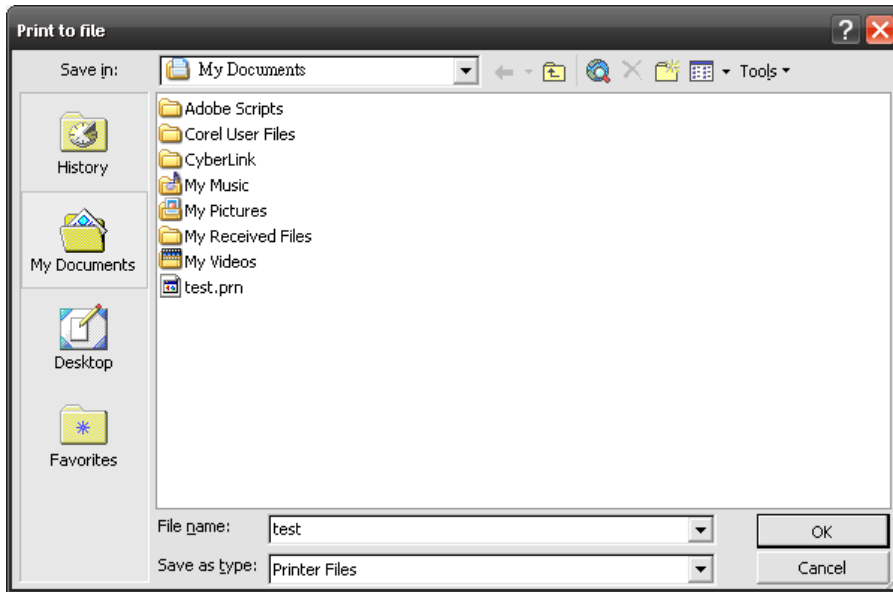
Enter filename

After entering the filename and pressing "ok", the Preview screen will be shown.
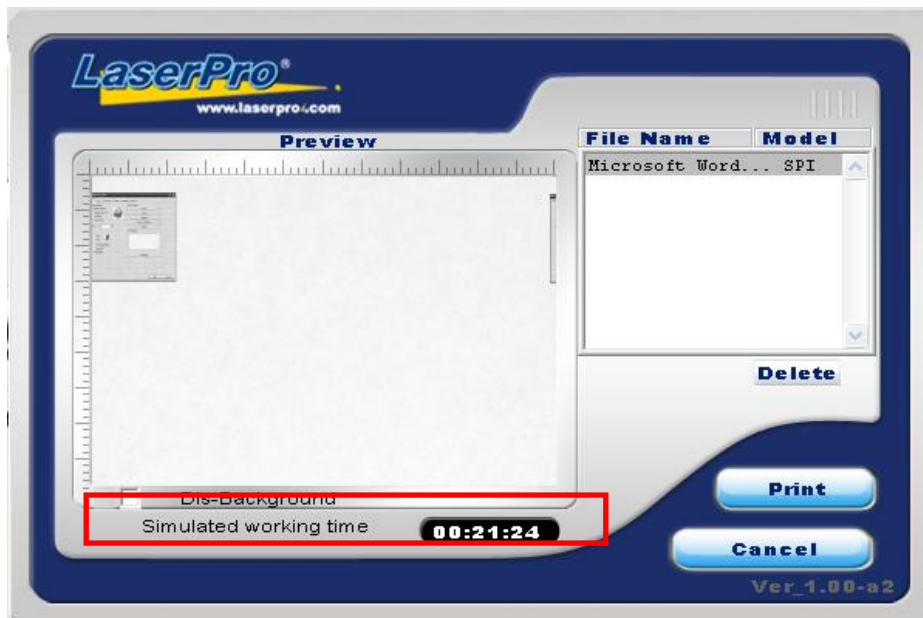

The output file can be previewed and a simulated working time of the job is also displayed.

File Function (Option Page):

The file function section allows you to manage various laser parameters. This section is useful when performing duplicate jobs on a variety of objects, allowing you to save your frequently used laser parameters and load them in the future.

- **History File:** This section contains a list of the recent files you have recently created and worked with.
- **Save:** This function will save the current print driver parameter settings to a file and location on your computer of your selection. (Saved parameter setting files will be tagged with the .X500 SERIES extension)
- **Load:** This function allows you load previously saved print driver parameters.
- **Original:** This function will load the print driver's original factory parameter settings.
- **Save To Default:** This function allows you to save your current print driver parameters as the default start-up settings.
- **Delete:** This function will delete the file you select from the History File section. Please note the Delete function only removes the file from the history file section, it does not remove the .X500 SERIES file from your hard drive, if you wish to completely remove the file from your hard disk, then you will have to manually delete the file from your operating system.)

> **NOTE**
> If you are using Windows 2000/XP/Win 7 as your operating system, then make sure you log in with an administrator or administrator-rights account in order to properly save laser parameter settings.
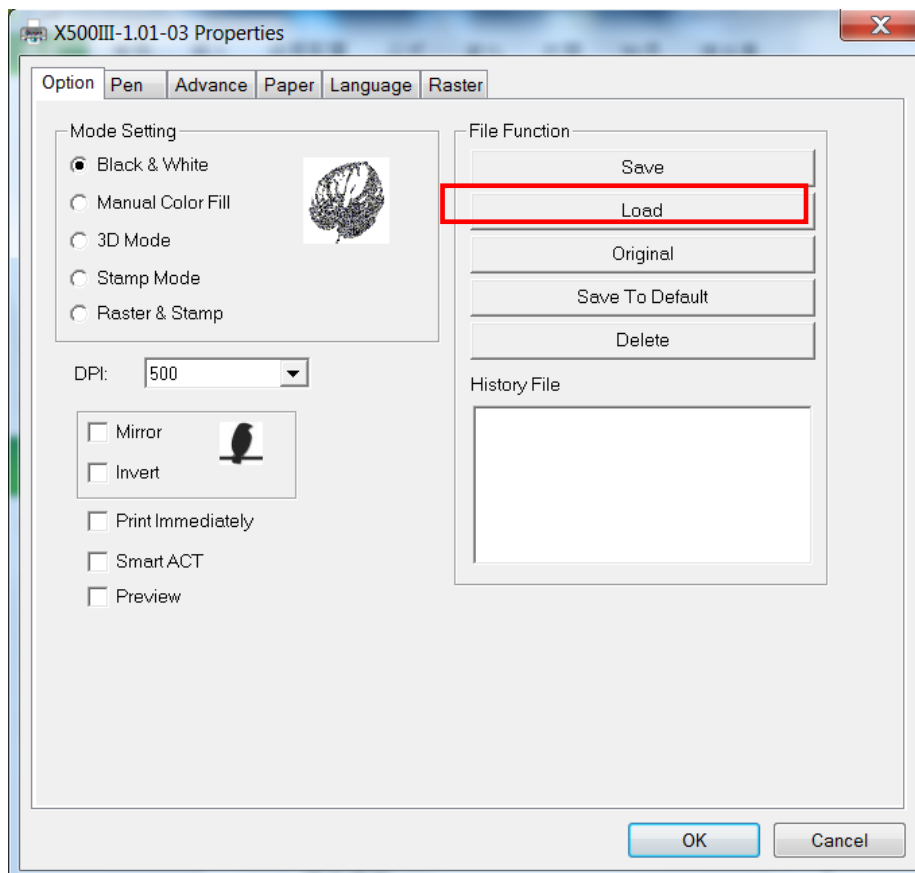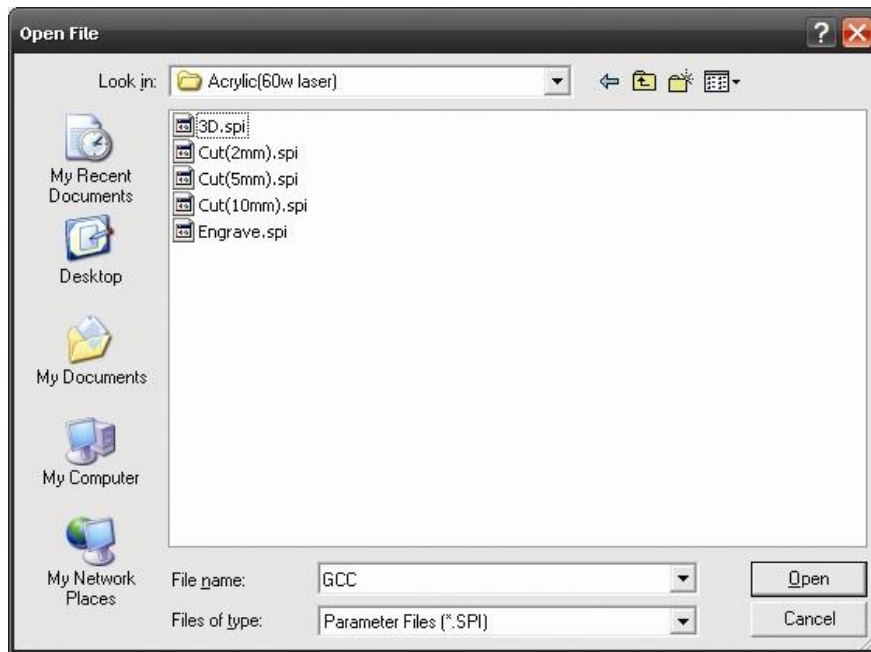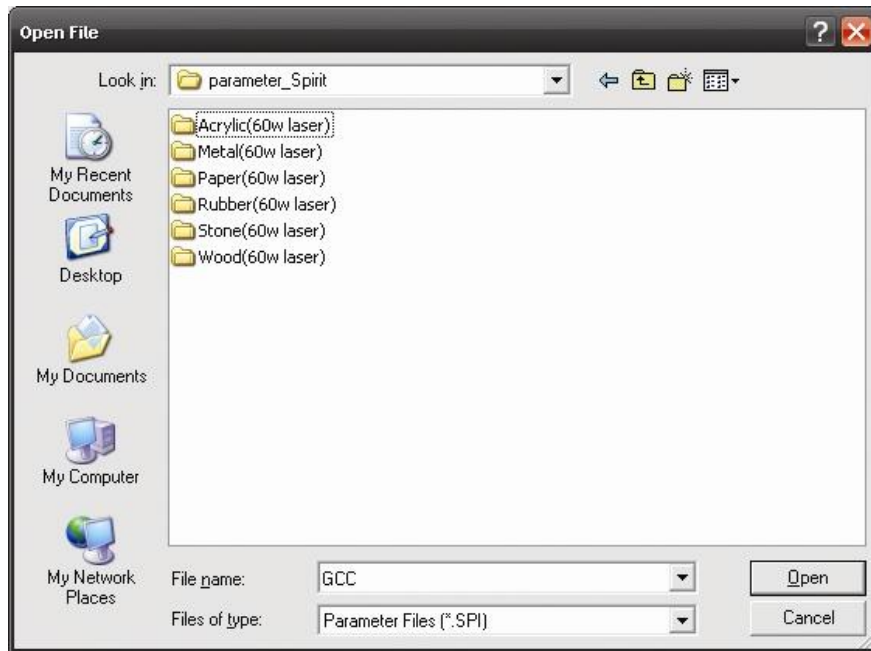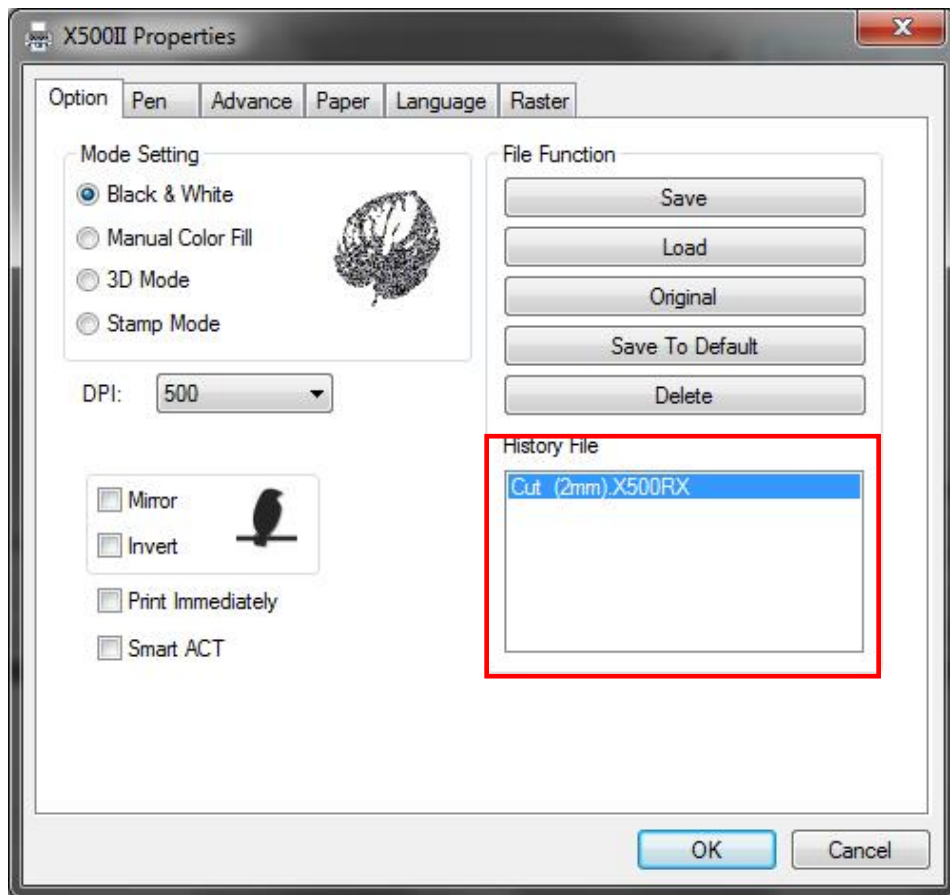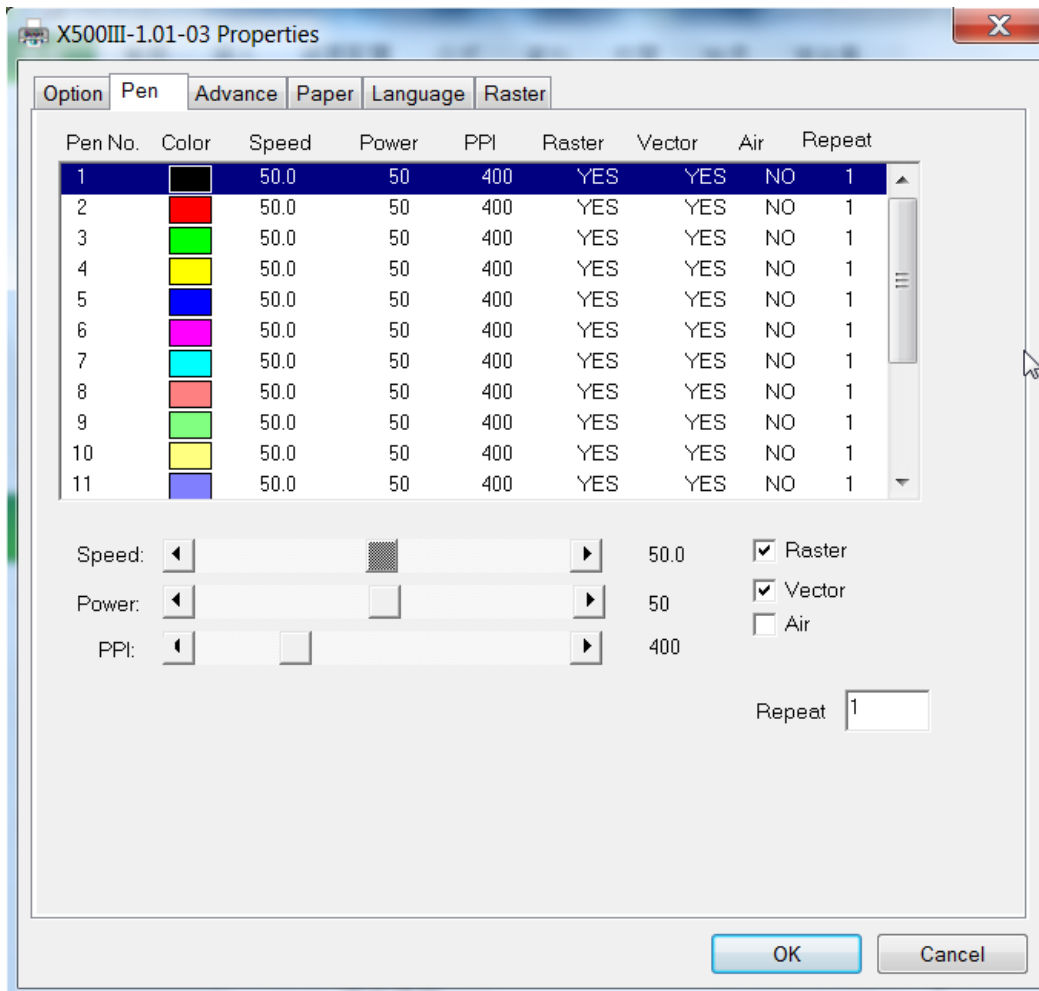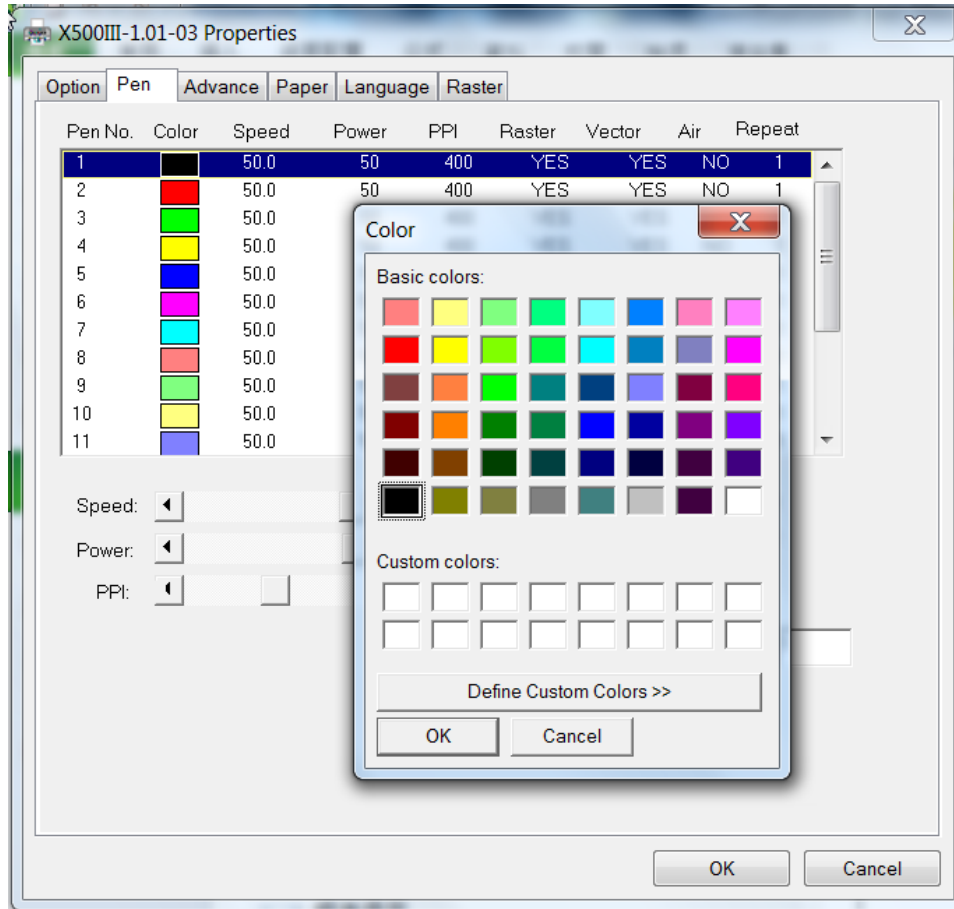
5.2.3.2 LaserPro X500 SERIES Print Driver >> Pen Page

The LaserPro X500 SERIES incorporates the use of 16 different colors to represent 16 different laser power and speed settings when cutting and engraving. These colors are referred to as "Pens". Think of each pen as a designated laser setting, rather than as a color. As an example, a black and white image will use only one power and speed laser setting (Black). An image that is made up of black, red and blue colors will be processed using the laser settings designated for each particular color. In order to utilize up to 16 different pens (laser parameter settings), make sure your graphics software can recognize and utilizes the 16 pen colors designated by the LaserPro X500 SERIES print driver.

If you would like to specify your own colors to designate to a particular laser setting, then all you have to do is to double-click on that particular pen color from the pen menu and a color manager window will open where you can select "define custom colors" to define your own color (shown in the picture below). This is useful when your image is composed of colors that are not part of the pen menu's default color selection, and instead of modifying your image, you simply assign the laser settings based on the existing colors based on your current image.

> **ⓘ NOTE**
> The LaserPro X500 SERIES print driver cannot store more than 16 pen colors or different laser parameter settings per file.

Speed (Pen Page) [DEFAULT SETTING: 50]

The speed slider controls the laser's speed during operation (engraving speed) with settings ranging from 0.1 – 100%.Only when moving in straight line with enough distance, the carriage can achieve 100% speed. On the other hand, the machine will automatically slow down when processing curves so the speed % indicator only presents maximum speed % that laser can achieve but not equal to actual laser carriage moving speed. It is exactly like driving a car on a straight road, you can driver faster and on a curve road you have to slow down.

Laser pulse frequency is controlled by the speed setting for vectors and it is opposite to pulse width, meaning higher speed setting for vectors, lower pulse width, and thus less cutting capability. Not only speed% setting affects actual processing time but also the job size, complexity of the graphic and the position of the graphic in the working area..

Power (Pen Page) [DEFAULT SETTING: 50]

The power slider controls the laser's power during operation (engraving/cutting power) with a range setting from 0 – 100%. The percentage setting represents the power for each laser pulse fired. The lower the power setting, the shallower it engraves or cuts, and vice-versa.

> **TIP**
>
> Cutting / engraving depth are determined by a combination of power and speed. Slower speed at higher power will produce deeper cuts and engravings, whereas higher speeds at lower power will produce more shallow cuts and engravings.

PPI (Pen Page) [DEFAULT SETTING: 400]

PPI (pulses-per-inch) represents the pulsing frequency of the laser pulse (fire) numbers within an inch exclusive for vector cutting. Higher PPI settings may cause more melting, burning or charring on the edges when cutting. Lower PPI settings may reduce this effect, but may result in a serrated looking edge. If you drag the PPI slider to the maximum, the value will change to X. This completely disables the PPI control and turns on the laser continuously without pulsing.

This disables the power ramp functionality, which automatically controls the PPI depending on the speed of the laser carriage (such as vector cutting around the corner of a square).With PPI to X. the cutting corner with slower speed will generate over burn or melting.

> **TIP**
>
> 1. When cutting thicker materials, suggest setting PPI to X and slow speed setting to melt/cut through the material
> 2. When cutting thin material or do kiss-cutting, it is recommended to set the PPI value to 400 and slower speed setting to keep curve and line with consistent cutting result, no over burn in corner.

Raster / Vector (Pen Page) [DEFAULT SETTING: Selected]

Checking the Raster checkbox will process only the raster functions for the areas of your design that correspond to that particular "pen" color.
Checking the Vector checkbox will process the vector functions for the areas of your design that correspond to that particular "pen" color.

As an example: a particular "pen" color may be assigned to areas in your design containing color fills (raster engraving) and very thin lines (vector cutting). By checking / un-checking the Raster and Vector will force the driver to process / ignore the color fills / thin lines.

	Vector Checked	**Vector Unchecked**
Raster Checked	Processes both Vector and Raster functions for that particular color	Processes only the Raster functions for that particular color (Vector functions ignored)
Raster Unchecked	Processes only the Vector functions for that particular color (Raster functions ignored)	Does not process Vector or Raster functions for that particular color

Air (Pen Page) [DEFAULT SETTING: Unselected]

This checkbox controls the SmartAIR air-assist function (if you have the optional air compressor installed). By selecting a pen color and checking this box will enable the SmartAIR air-assist function for that

particular pen color. As an example, if you are performing a combination of both surface raster engraving job and deep vector cutting on a material such as acrylic, you may want to enable the SmartAIR air-assist for the vector cutting sections to get the cleanest cuts. To do this, you would simply need to select the pen color that you have assigned to the sections to be cut and select the Air checkbox for those particular pen colors.

## 5.2.3.3 X500 SERIES Print Driver >> Advance Page
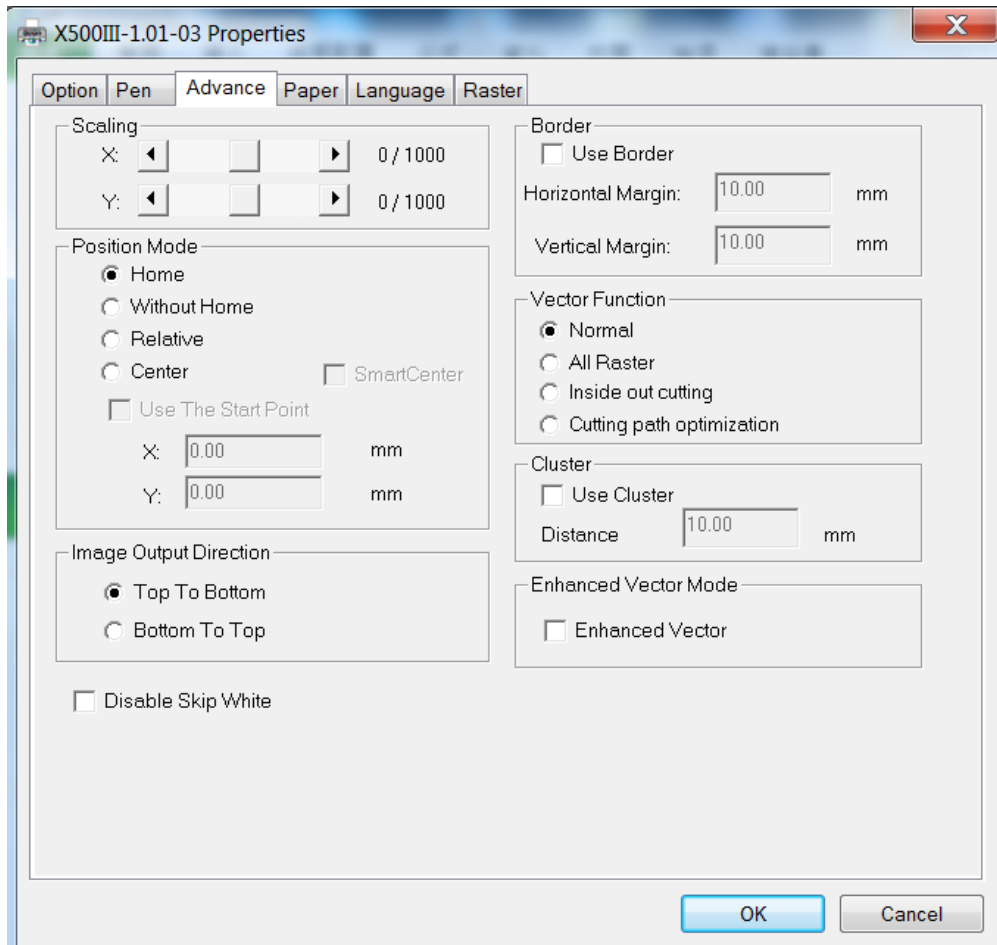
Scaling (Advance Page) [DEFAULT SETTING: 0]

In some cases you may find a slight output inaccuracy in the actual output compared to what you have set in the computer. This margin of error or offset is extremely small (approximately 1/300). What this means is that there may be a 1-unit offset for every 300 unit increments. As an example, if you engrave a 300mm straight line, it may end up measuring only 299mm or 301mm in the final output. In this case, you will want to set the scaling setting to +1 / 1000 or -1 / 1000 respectively to compensate. A general rule of thumb is for every 300 unit increment, you will want to adjust the slider by +1 if the final output is 1 unit increment shorter or -1 if the final output is 1 unit increment longer than your graphic design setting.

Position Modes (Advance Page) [DEFAULT SETTING: Home]

These selections allow you to control the positioning of the lens carriage after each job completion and before the next subsequent job.

- **Home:** Resets the positioning of the lens carriage to the 'home position' (upper-right) before and after each job.
- **Without Home:** The lens carriage will start the next job based on the position from its graphic application software setting, from the last position of the previous job. Upon completion of the current job, the lens carriage will remain at the last position of the previous job.
- **Relative:** This mode sets the current lens carriage position to correspond to the origin (top left) position of the graphic software. Therefore, the lens carriage will process the job from its current position relative to its setting in the graphics software.
- **Center:** Sets the current position of the lens carriage as the center point for your subsequent job. As an example, if the subsequent job is to vector cut a circle and you have the Position Mode set to Center, then the machine will vector cut a circle around the initial position of the lens carriage.
- **SmartCENTER**: The SmartCENTER function is a quick and easy way to precisely locate the center point between two points or four points.
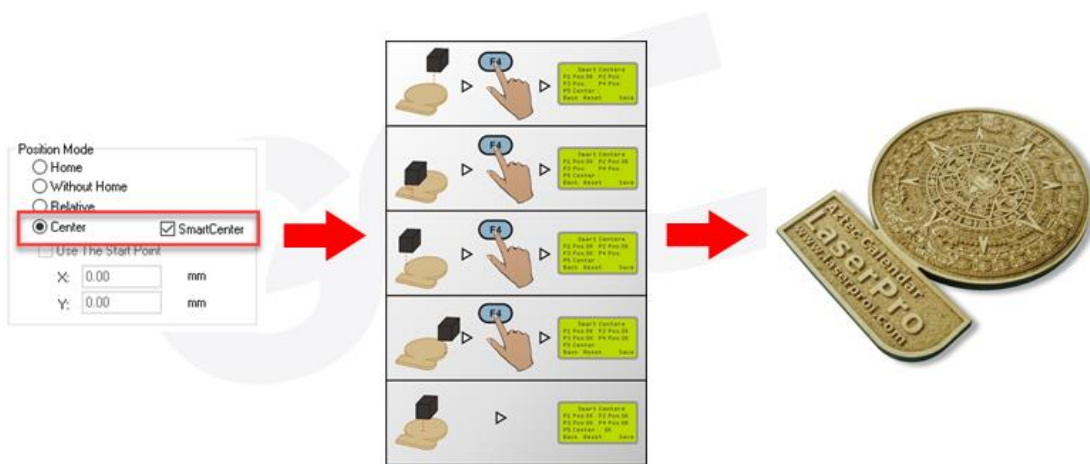
TIP

It is highly recommended you enable the red dot laser pointer when setting / adjusting the Position Modes, as this will ease your job positioning with more accuracy.

Image Output Direction (Advance Page) [DEFAULT SETTING: Top to Bottom]

These selections allow you to control the direction in which the system processes an engraved image.

Top To Bottom   Bottom To Top

- **Top To Bottom:** Selecting this will force the system to process the current task by moving the laser carriage from the top to the bottom of the image (rear end to front end of the work table).
- **Bottom To Top:** Selecting this will force the system to process the current task by moving the laser carriage from the bottom to the top of the image (front end to rear end of the work table)

Normally, the LaserPro X500 SERIES engraves from left to right, top to bottom. Selecting Bottom Up will force the machine to start from the bottom and work its way to the rear of the working table.

> **TIP**
> In situations where the material you will be working with may produce a lot of dust byproducts and you are utilizing the optional Fume Extraction system, it is recommended you select the Bottom To Top image output direction option. This will minimize the amount of dust byproducts lodged in the engraved sections as the Fume Extraction system is vented from the rear of the machine, the same direction as the image is processed.

Border (Advance Page) [DEFAULT SETTING: Unselected]
In cases where you are working with a negative image (negative outline areas of your image are engraved, rather than the positive areas), you may wish to include a border around your image. To properly add a border, you will first need to Invert your design from the Option Page, then check Use Border and specify a value for the thickness of the border you would like to add to your design.

This mode is useful for engraving rubber stamps, as it allows you to create the outline around your stamp image.

> **NOTE**
> If you wish to use the Border and Cluster function simultaneously, then the Border Thickness value must be **less than** the Distance value specified in the Cluster setting.

Vector Function (Advance Page) [DEFAULT SETTING: Normal]

- **Normal:** This selection will not apply any special advanced vector function to your job. This is the default Vector Function setting.
- **All Raster Output:** This selection will instruct the print driver to process your entire image as a raster engraving. Any vector lines within the image will be treated as raster data and outputted as a raster engraving, similar to a dot-matrix printer.

Vector Processing   Raster Processing

- **Inside Out Cutting:** This setting will always automatically direct the laser to cut from the inner most vector shape and move outwards.
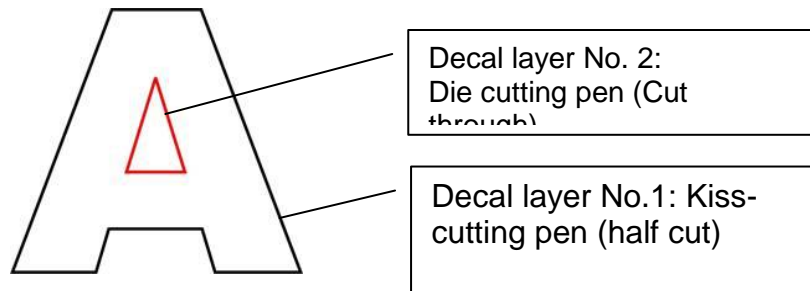

- **Cutting Path Optimization:** This is a setting that will minimize your process time. When selected, the print driver will analyze your image and automatically determine the most efficient processing path to process your image.

- **Decal Cutting**: this function is developing to reduce material weeding job after laser cutting for multiple layers adhesive materials, such as lettering vinyl, heat transfer film, and twill film. This function allows allocating different parameters for corresponding decal layer numbers to do die cut (cut through media) for the unwanted parts, and kiss-cut (half cut) for the kept material parts, after the laser cutting, users can just peel off the materials to get rid of waste parts.

Visit GCC LaserPro Youtube channel for decal cutting introduction video at
https://www.youtube.com/watch?v=YgGTMHqtWqE&feature=youtu.be

Decal layer No. 2:
Die cutting pen (Cut
through)

Decal layer No.1: Kiss-
cutting pen (half cut)

Cluster (Advance Page) [DEFAULT SETTING: Unselected]

This setting allows you to change how the X500 SERIES interprets and processes individual / independent areas of an image in order to minimize job-processing times. The Cluster function is only applicable when multiple areas of an image are broken down and isolated from each other (areas not touching each other, blank space in-between). Another condition that must be met for the Cluster function is that these individual areas of your design must have some X-axis overlap, meaning that they should be to some extent side-by-side with empty spaces between them. The distance value can be set by the user and represents the limit or cutoff point in which side-by-side objects will be processed in Cluster mode or not. If the distance between side-by-side objects is greater than the set distance value, then the individual areas will be processed in Cluster mode. Conversely, if the distance between side-by-side objects is lesser than the set distance value, then the individual areas will be processed normally (not via Cluster mode).

An example of an image that would benefit from the Cluster function would be: 2 squares to be engraved, side-by-side on the X-axis with a 20 cm gap in between them. In this scenario, you would want to enable the Cluster setting and set the distance to a value less than 20. By doing so, the laser will completely process one square and "leap-frog" to the second square, rather than processing both squares simultaneously. The result: you shorten the processing time by minimizing the unnecessary travel distance the lens carriage needs to make across the X-axis in between squares, if they were to be processed simultaneously.

NOTE

If you wish to use the Border and Cluster function simultaneously, then the Border Thickness value must be **less than** the Distance value specified in the Cluster setting.

Enhanced Vector Mode (Advance Page) [DEFAULT SETTING: Unselected]

This setting allows you to improve the cutting quality at the expense of speed. Your engraving speed will be dropped by 50%, to maximize the cutting power. We recommend that you enable this function when cutting thicker materials.

5.2.3.4 LaserPro X500 SERIES Print Driver >> Paper Page
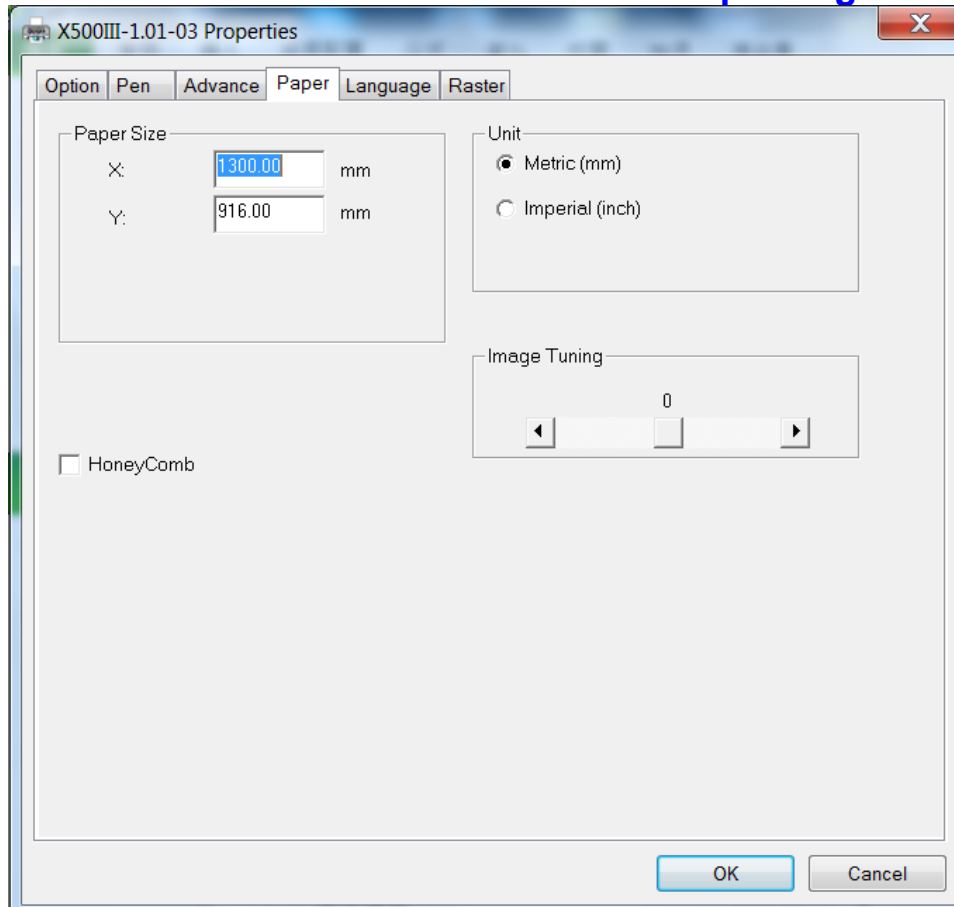
Paper Size (Paper Page)
The paper size represents your total work area. Ensure that the paper size is never set greater than the machine's worktable area of 51" x 36" (1300mm x 916mm). The X value represents the length and the Y value represents the width.

> **NOTE**
> When using the optional honeycomb table and with the honeycomb table option checked on Paper Page, the work area of laser system will be smaller to match with the honeycomb table.

Unit (Paper Page) [DEFAULT SETTING: Metric (mm)]
Here you can set your preferred measurement standard in which you would like use with the print driver. You can choose between metric or imperial standards.

Image Tuning (Paper Page) [DEFAULT SETTING: 0]
In the event that you are processing extremely fine and detailed designs requiring near-microscopic edge-to-edge precision, you will need to adjust the image tuning setting. To adjust this setting, we recommend that you engrave a small black square design as a sample and apply a magnifying glass to the engraved results.

When you look at your engraved test square under a magnifying glass, you may notice the edges of your square may be slightly offset, with every consecutive engraved even or odd line protruding past the square's ideal edge. This occurrence may occur on the left or right side of the square and can be compensated for by the image tuning setting. In the diagram below, the arrows refer to the direction the lens carriage is moving to generate that engraved line. If the first and every other line protrude to the **left** of the square's ideal edge, you will want to set the image tuning to a **negative value**. If the first and every other consecutive line protrude to the **right** of the square's ideal edge, you will want to set the image tuning to a **positive value**. The further the protruding lines are from the square's ideal edge, the larger you will need to set the Image Tuning value to compensate.
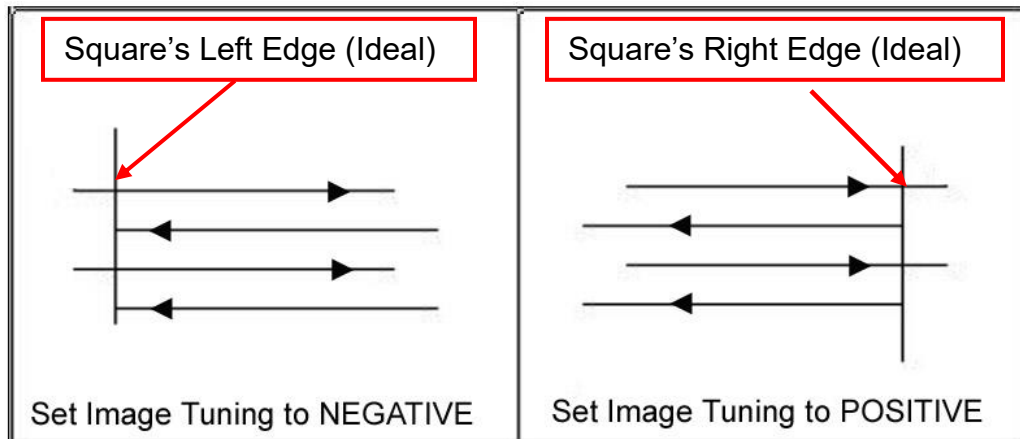

The following is an example that has the proper image tuning, and demonstrates this significance when engraving fine, small, intricate text. The following two pictures show engraved text magnified with no image tuning (left picture) and image tuning enabled (right picture).

## Honeycomb (Paper Page) [DEFAULT SETTING: unselected]

When the optional honeycomb table is installed on X500 series, make sure to check the Honeycomb selection on Paper page to synchronize the origin to the correct position. When Honeycomb is selected, the work area will be reduced to 1280x896mm or 50.39"x35.27".
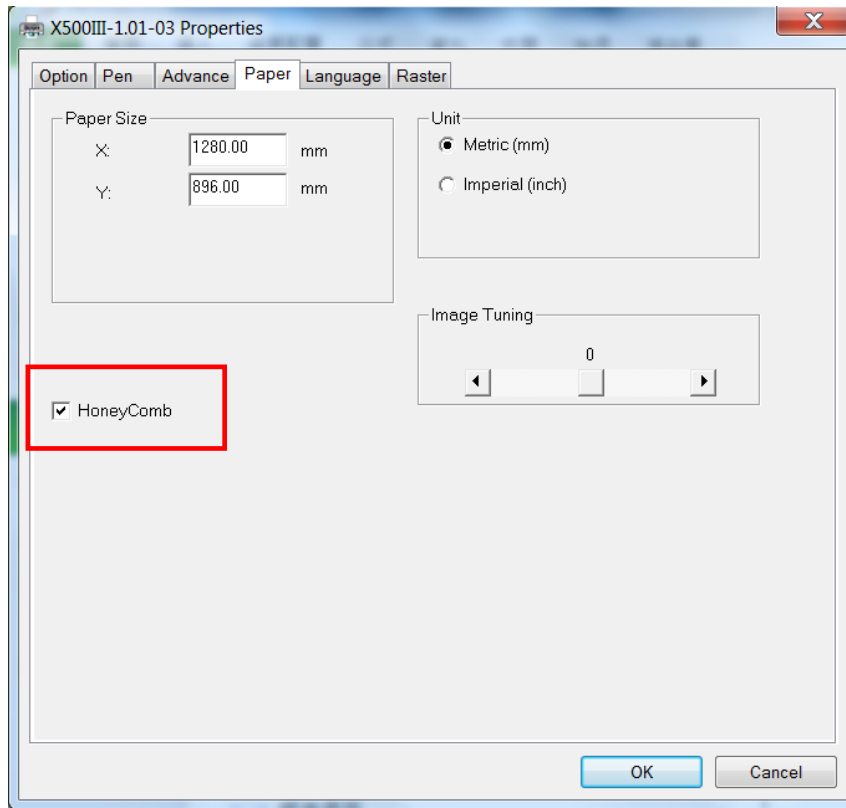
5.2.3.5 LaserPro X500 SERIES Print Driver >> Language Page

This page allows you to specify the language displayed by the Print Driver. Current language options allow for: English, Spanish, French, and Chinese (Simplified, Traditional), Japanese, and German.

Please remember to click "Save to Default" on Option Page after different language is selected.
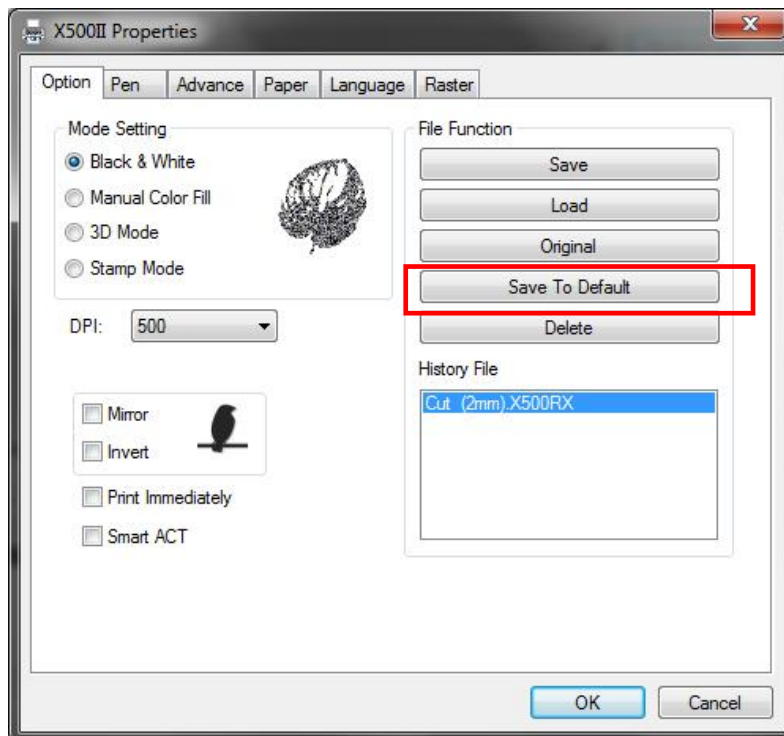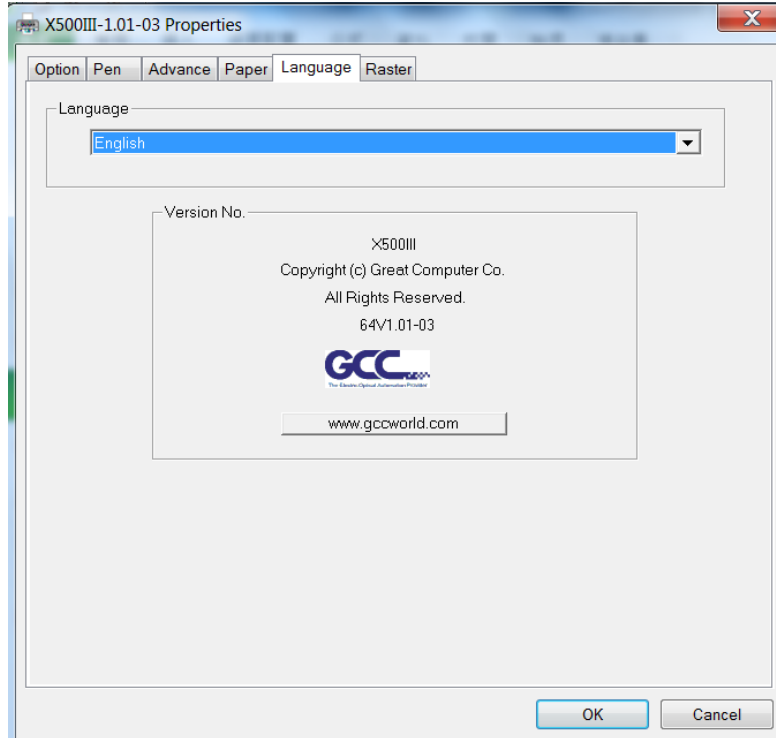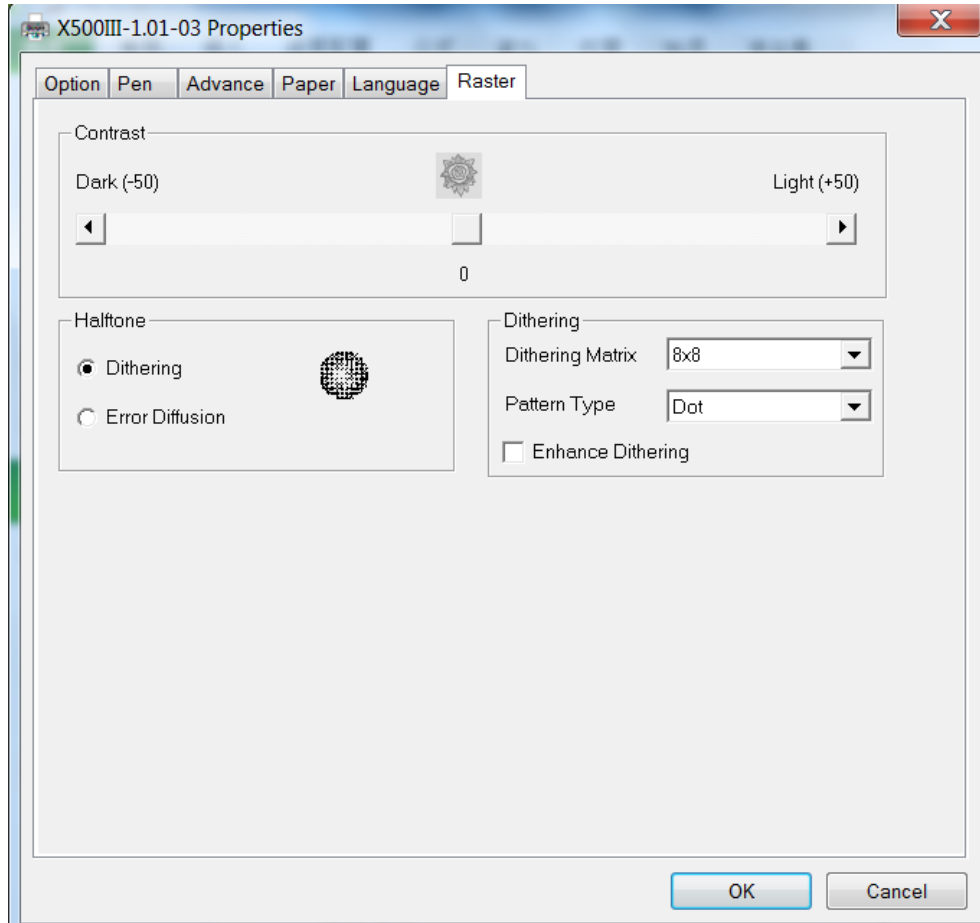
5.2.3.6 LaserPro X500 SERIES Print Driver >> Raster Page

> ⓘ **NOTE**
> The Raster Page is only available when Black & White Mode Setting is selected from the Option Page; this page offers a number of advanced Raster Engraving output options.

Contrast (Raster Page) [DEFAULT SETTING: 0]

This provides a quick and easy way to immediately adjust the contrast of an engraved image. Moving the slider to the Dark setting will increase the contrast levels of the engraved output, whereas moving the slider to the Light setting will decrease the contrast levels of the engraved output.

> 💡 **TIP**
> There are other ways to adjust an engraved image's contrast such as: adjust the power / speed settings or simply adjust the contrast of the image in software with the graphic software application.

Halftone (Raster Page) [DEFAULT SETTING: Dithering]

This option controls the way a raster-engraved image is processed. The "digital image to engraved output" process can be processed via two methods: Dithering or Error Diffusion. Each offer additional output options yielding different output effects, style, and quality.
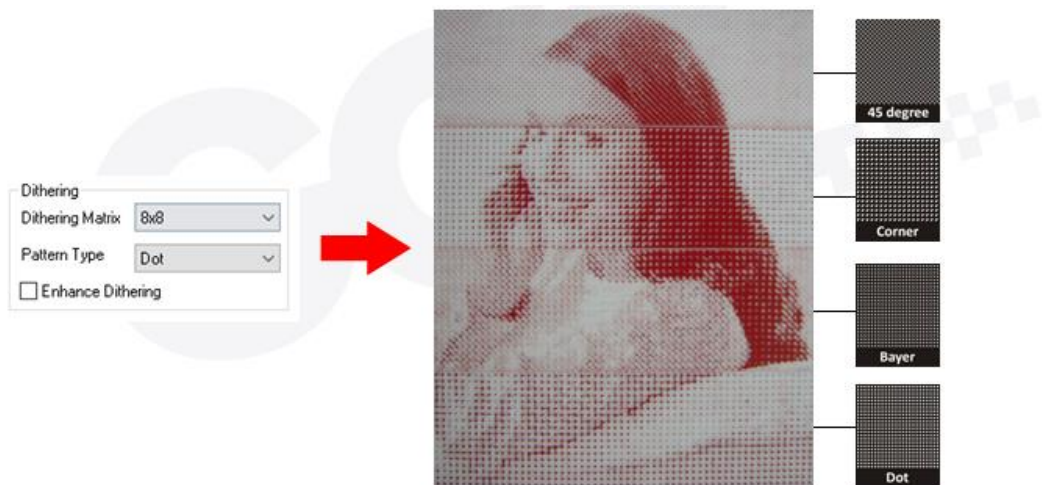
Dithering (Raster Page)

Interprets and outputs the raster engraving via the dithering method. This mode will allow you to select the Pattern Type and Dithering Matrix, and Enhanced Dithering.

- ○ **Pattern Type: Dot, Bayer, Corner, 45 Degree**

  Each pattern type uses a different shape and arrangement of dots to compose the shading effect of a raster image.

 The following diagram is an example of the raster effects when using the different pattern types.

- ○ **Dithering Matrix**: Variable depending on the Pattern Type selected. [DEFAULT SETTING: 8x8]

  This controls the resolution (dot size) and the number of dots the image is broken down into for the dithering process. As an example, selecting 2 x 2 will shade with a 5-grade halftone, where as an 8 x 8 Dithering Matrix will dither with a 65-grade halftone.

  The following diagram is an example of the raster effects when using the different dithering matrices.

2 x 2 Dithering   8 x 8 Dithering   2 x 2 Enhance Dithering   8 x 8 Enhance Dithering
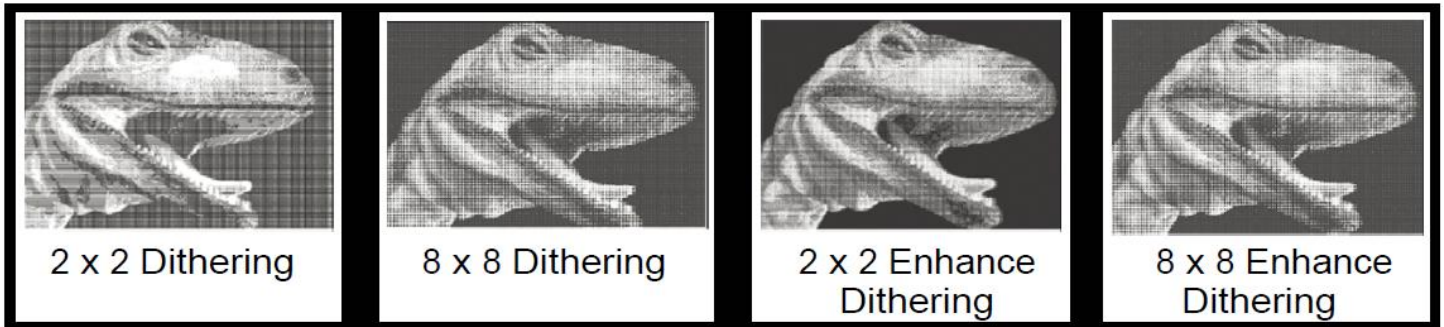
- ○ **Enhance Dithering** [DEFAULT SETTING: Unselected]

   Selecting this will produce a finer dithering output.

- **Error Diffusion**: Interprets and outputs the raster engraving via the error diffusion method. This mode will allow you to select from three diffusion types: Floyd, Stucki, and Jarvis.

   - ○ **Diffusion Type: Floyd, Stucki, Jarvis** [DEFAULT SETTING: Floyd]

      Each diffusion type presents the shade of image as different spread halftones instead of dots to compose a raster image.

      The following diagram is an example of the raster effects when using the different diffusion types.

Floyd   Stucki   Jarvis
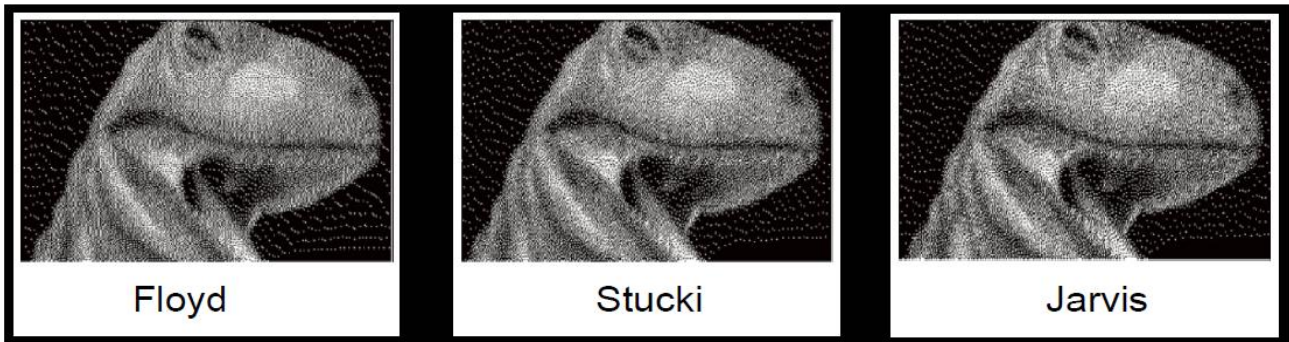
TIP
There is no "correct" or "best" setting when using the Raster options. The most appropriate settings will be based on a variety of factors: your design, the material you are engraving on, and the results you wish to achieve, etc. Please take some time to experiment with the multitude of raster options to get the one you feel is the best for your piece. This is where much of the fun in engraving is….experimentation!

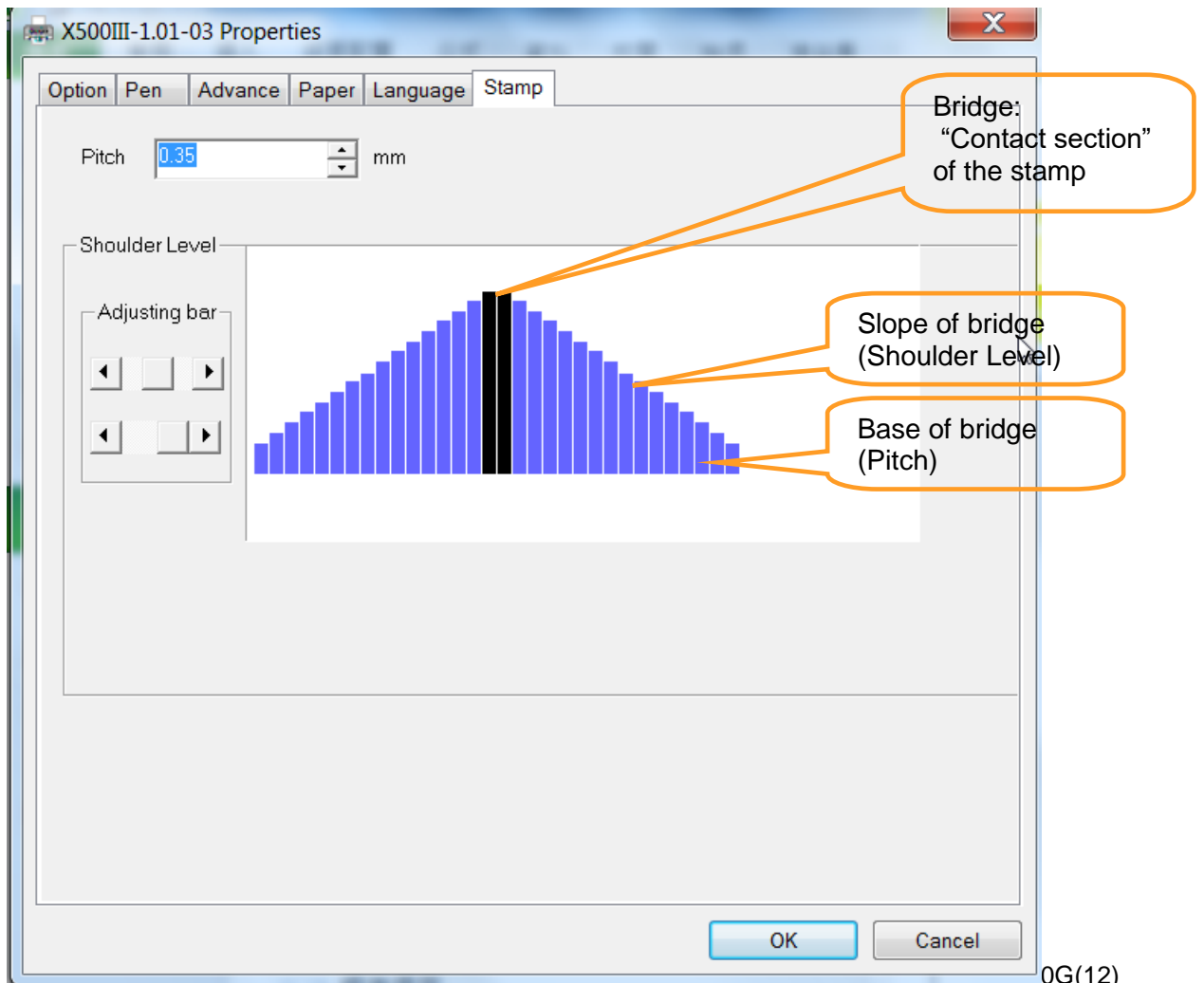## 5.2.3.7 LaserPro X500 SERIES Print Driver >> Raster Page

Producing stamps require different operational steps than your standard engraving or cutting jobs. The Stamp page offers dynamic options allowing you to customize your stamp production process.

ⓘ **NOTE**

The Stamp page will only appear and be accessible when you have selected the Stamp Mode from the Option Page.

💡 **TIP**

Functions located on the other pages that are useful when making a stamp: **Set Shoulder, Pitch, Border, Invert,** and **Mirror**.

Pitch (Stamp Page)

Your stamp will be a reversed image composed of engraved depressions and ridges. Think of these ridges as the "contact sections" of the stamp. If the ridges of these contact sections are too thin, they may break. The Pitch setting allows you to increase the width of the ridge base, hence creating more stable "contact sections" and longer lasting stamp. The pitch value setting allows you to adjust the base width of the ridge. Broad pitch gives the maximum amount of support for each ridge. Experiment with different pitch value settings in order to produce the stamp that is best suited for your application.

Adjustment Bar / Power Level (Stamp Page)

Another important aspect of creating a stamp is setting the slope level of the shoulder. The shoulder is the section from the "contact section" of the stamp to its base. This function allows you to adjust the slope for the shoulder sections of your stamp. By sliding the sliders or directly input of power levels, you will be able to change the slope of the shoulder.

> **ⓘ NOTE**
> The visual representations of the Pitch and Shoulder Levels in the GCC print driver are an exaggerated representation to allow for easy visual guidance and precise input. Remember we are working with distances less than 1 mm here.

Chapter VI - Engraving and Cutting Techniques

6.1 Raster Engraving

A laser engraver can process text, scanned image, digital picture, or design by "laser firing" grids / dots of individual pixels into a raster image. Think of this as simply "printing" your job onto any particular material. An example of a raster engraved piece would be a photo engraving on tile, as shown in the picture below.

6.2 Vector Cutting

A laser engraver can process text, design, and images composed of lines through continuous-firing of the laser to cut out various shapes. When performing vector cutting operations, imagine the lens carriage as a pair of scissors cutting out the lines specified in your design. An example of a vector cut piece would be a customized dining mat, as shown in the picture below.

The LaserPro X500 SERIES Print Driver determines which sections should be raster engraved or vector cut based on the outline width of that particular area or section of the design. In order to prep a

particular section for vector cutting, you will need to set that object's fill color to white and set its outline thickness between 0.001" (0.025mm) to 0.004" (0.1mm) via the graphics software.

Below is an example of how to prep an area (in this case, we will use a section of text) for vector cutting. CorelDraw will be used as the selected graphics software.

With the text function, create a string of characters and select those characters by clicking on the text.

Change the text fill color of the selected characters to white by left clicking on the white color from the CorelDraw Color Palette (located on the right hand side of the screen).

Change the outline color of the selected characters outline by right clicking on the desired color from the CorelDraw Color Palette.

Change the selected characters outline thickness to the thinnest width by right clicking on the selected text → select <Properties> → Click on the <Outline> tab and change the Width to its thinnest dimension. Click on "OK" to apply the changes.

Now your string of characters has been properly designated as an area to be vector cut. Simply "print" your job (output the file to the machine) and watch as your string of characters is vector cut.

6.3 Vector and Raster

In some cases, you will want to process both raster engraving and vector cutting tasks within a single project. For example, if you wanted to engrave a design onto a particular material and then cut a particular shape around that engraving. The picture below is an example of an engraving on a piece of cork, which has then been cut out with a square shape:


In these situations when there are raster engraving and vector cutting operations on a single project, the LaserPro X500 SERIES driver will interpret between raster sections and vector sections by the types of lines and line widths of your design. Areas of your design with line widths set between 0.001" (0.025mm), 0.004" (0.1mm) will be designated for vector cutting, and the other areas will be designated for raster engraving.

6.4 3D Tips

3D processing uses degrees of the gray level to adjust the output energy of the laser. Take the figures below as an example. When the color of a certain block is set as 100% black, the laser output energy for processing will be at 100%. The processing depth will be fairly deep. When the gray level is set as 50% black, the laser output energy will be adjusted to a smaller value accordingly so that the processing depth is not as deep.

By specifying the degrees of the gray level in this way, various energy output is achieved and the 3D effects are produced.
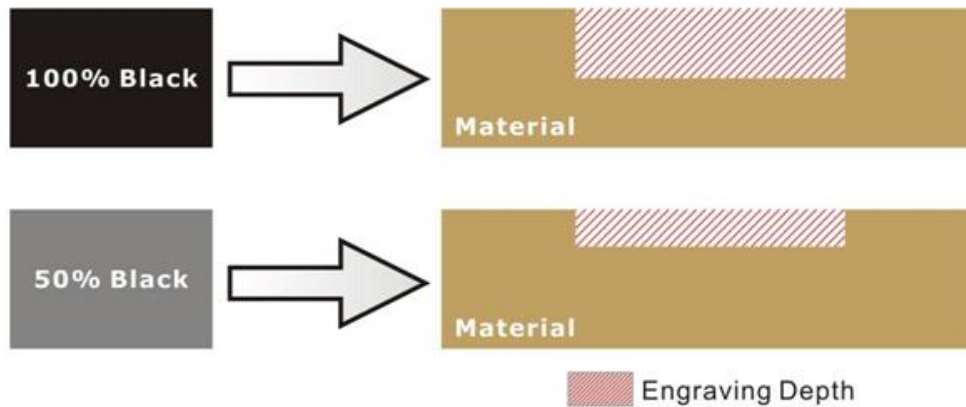
By specifying different levels of black in design software, the corresponding laser power energy will generate different depths of engraving result.

Introduction to software for 3D graphic production

Many ways to produce 3D graphics are available. If you are familiar with or frequently use one of the 3D software in the market like Laser Type, EngraveLab, 3D Studio etc., you may use it for the production of 3D graphics. After completion, save the 3D images as one of the formats that is compatible with the Laser Engraver (such as JPG or BMP) and let the machine begin the engraving. If you are not familiar with any 3D software, some editing software specific for laser in the market also have 3D mode functionality, which could be a handy tool for you to produce 3D objects. Of course, you may also use Photoshop or CorelDRAW, which you might be using on daily basis, for the production of 3D objects. Ways to produce 3D graphics with these software are not the same. In the following section, we will give you simple illustrations with respect to how these software work.

Laser Professional AP

Currently, quite few laser professional application softwares like Laser Type, 3D studio, EngraveLab are available in the market. You can not only create all kinds of vector images with these AP but also convert these vector images into 3D module, which is a great way to produce 3D graphics.

As illustrated in the figure below, all you need to do is to choose the direction of the vector and then set the length and shape of the convex or concave surface. The software will automatically generate the 3D graphic for you.
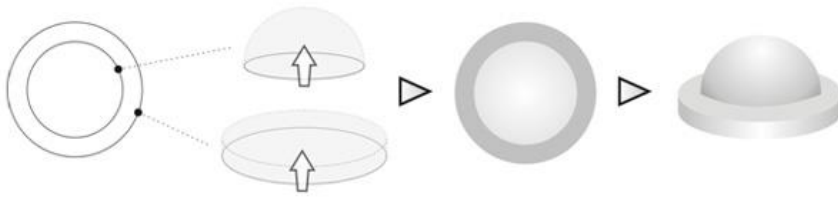
Concept illustration of 3D graphic production with Laser Professional AP

After the graphic is completed, you can output the 3D graphic directly to the laser machine through GCC LaserPro driver, which is very handy. Or you can also export the 3D graphics as JPG or BMP format and edit with frequently used CorelDRAW or Illustrator software, then output the graphic to GCC laser system.

Photoshop & CorelDRAW

The way to produce 3D graphics with Photoshop and CorelDRAW is very similar. Fill in the desired gray level colors to each of the drawn figures, and proceed with further arrangement and combination. Then you may output the 3D graphic to the laser for the production of the 3D object. Take the figure below as an example. After producing two graphs in gray level, proceed with the arrangement and combination. Then you may let the laser proceed with 3D mode.
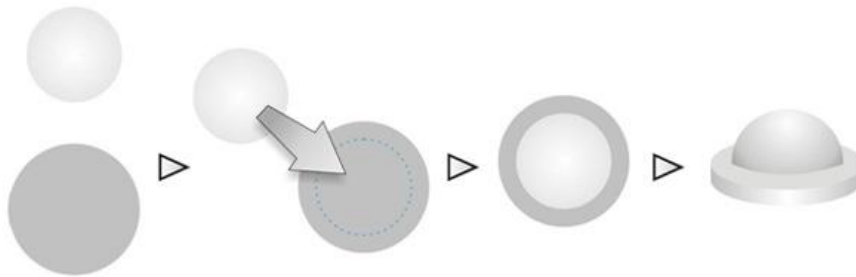
Both Photoshop and CorelDRAW may produce 3D graphics in the manner of combination.

A way to produce 3D graphics

For the production of 3D graphics, in addition to the requirement of having great familiarity with the software, a significant amount of time is required to design and arrange the layout. Thus, we use a relatively simple graphic for illustration so that you would understand how to produce 3D graphics better.

Take the graphic above as a production example. CorelDRAW is used for the production of the 3D graphic.
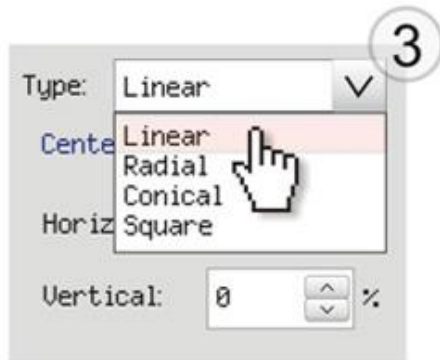
Step 1. Produce the gray level background
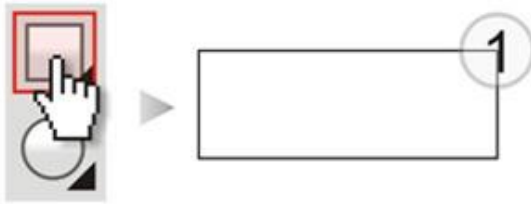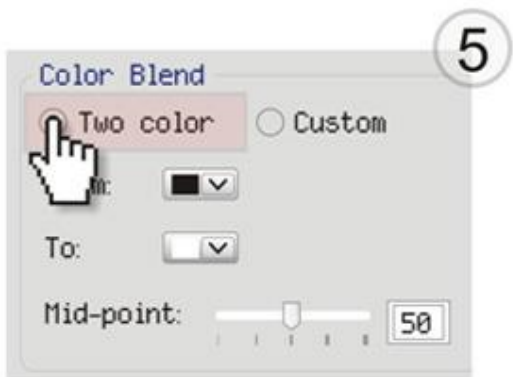

▲Draw a rectangular box with the drawing tool
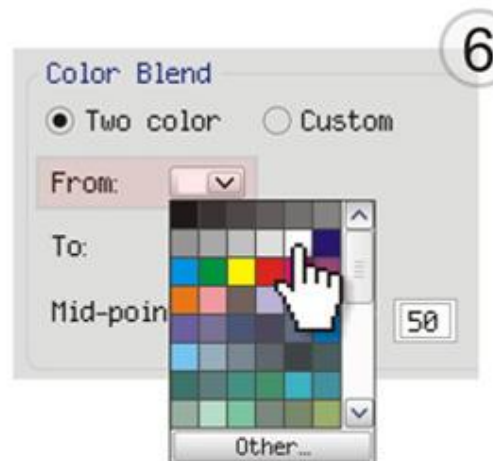

▲Select Fountain Fill to fill in the gray level

▲Select Linear as the type of the gray level
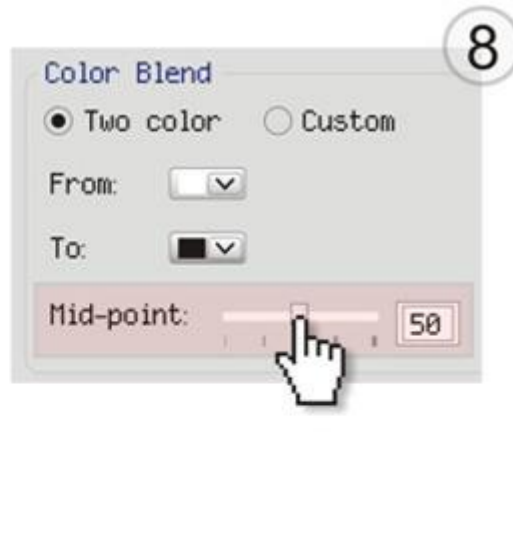

▲Set the gray level angle as 90 degrees

▲Select Two color as the type of the gray level

▲Set the From color as 0% Black

▲Set the To color as 100% Black

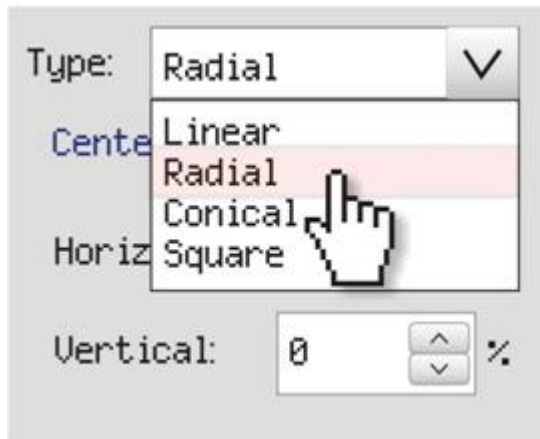▲Set the Mid-point as 30

▲Click OK to complete the editing

▲A gray level graphic is finished

LaserPro requests your attention

If you need to produce circular 3D graphics, you only need to select Radial as the gray level type in the pull-down menu of Type. Then, a circular 3D graphic may be produced.

Step 2. Produce three-dimensional characters

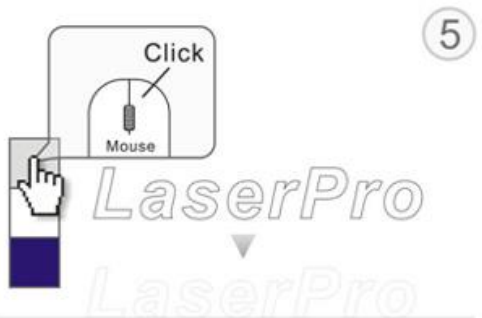① ►LaserPro

▲Edit the word with the Text toolbox

② LaserPro ▼ LaserPro

▲Use the Color toolbox on the right to fill the white color into the characters

③ O Arial ∨ 123 pt ∨

LaserPro

▲Select the desired font and size

④ B I U

LaserPro

▲**Bold** and *italic* style may also be used

⑤ Click Mouse

LaserPro ▼ LaserPro

▲On the palette, set the exterior frame as 10% gray level (Right click the mouse to set the color of the line for the exterior frame quickly)

⑥ Outline Pen... Outline Color... X None
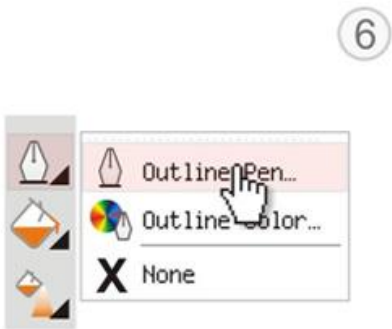
▲Click on the Outline Pen tool

⑦ Color: ∨ Width: 5 mm ∨ millimeters ∨

▲Set the width of the line for the exterior frame

⑧ ✓ Behind Fill ale image

▲Check the Behind Fill option

▲Click OK to complete the text editing

▲Three-dimensional characters are completed

Step 3. Edit the characters for the website

▲Edit the word with the Text toolbox

▲Select the desired font and size

Step 4. Combine the 3D images

After finishing the production for each of the objects, you may proceed with the combination of the objects. The combined graphic may be output with the laser engraver.

Output the 3D graphic

After selecting the graphic to be output, set the Mode as 3D Mode in the driver. After setting the engraving parameters, output the 3D graphic.
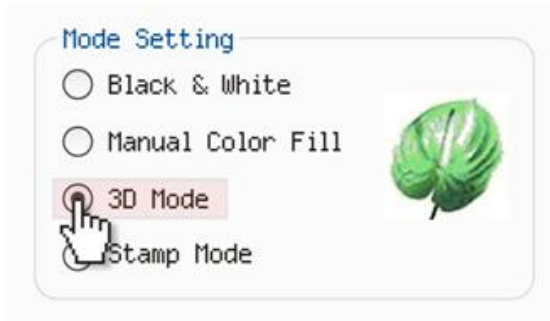
Tips for engraving 3D graphics

LaserPro Application Lab provides a few reminders that may require your attention during the 3D engraving in order to improve the result of the engraving.

Turn on the Air Assist function

When the engraving is done along with Air Assist, the depth of the engraving would be deeper. Set Air assist inside the driver by checking the box.

Polish

Dust will accumulate during the engraving when acrylic is engraved. The acrylic may be polished with Polish after the engraving. After the processing, don't remove the engraved object. Use the Control Panel to lower the platform (for about 7~8 mm) and then engrave once again to achieve the better finish.
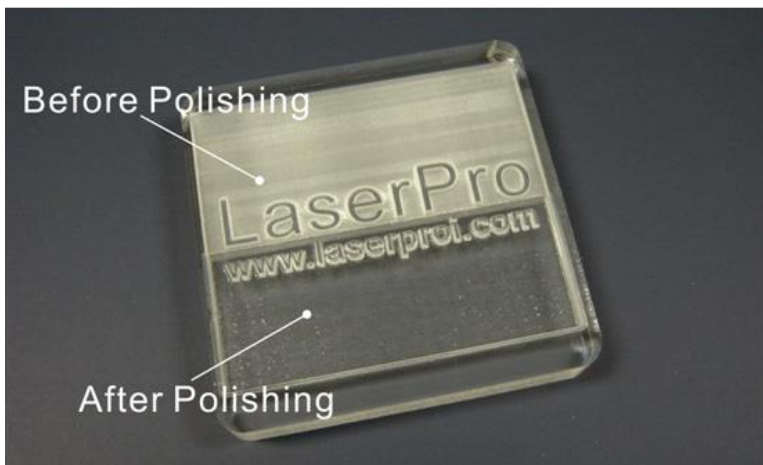
After engraving the wooden objects, please use a toothbrush with some clean water to remove the dust on top of the object.
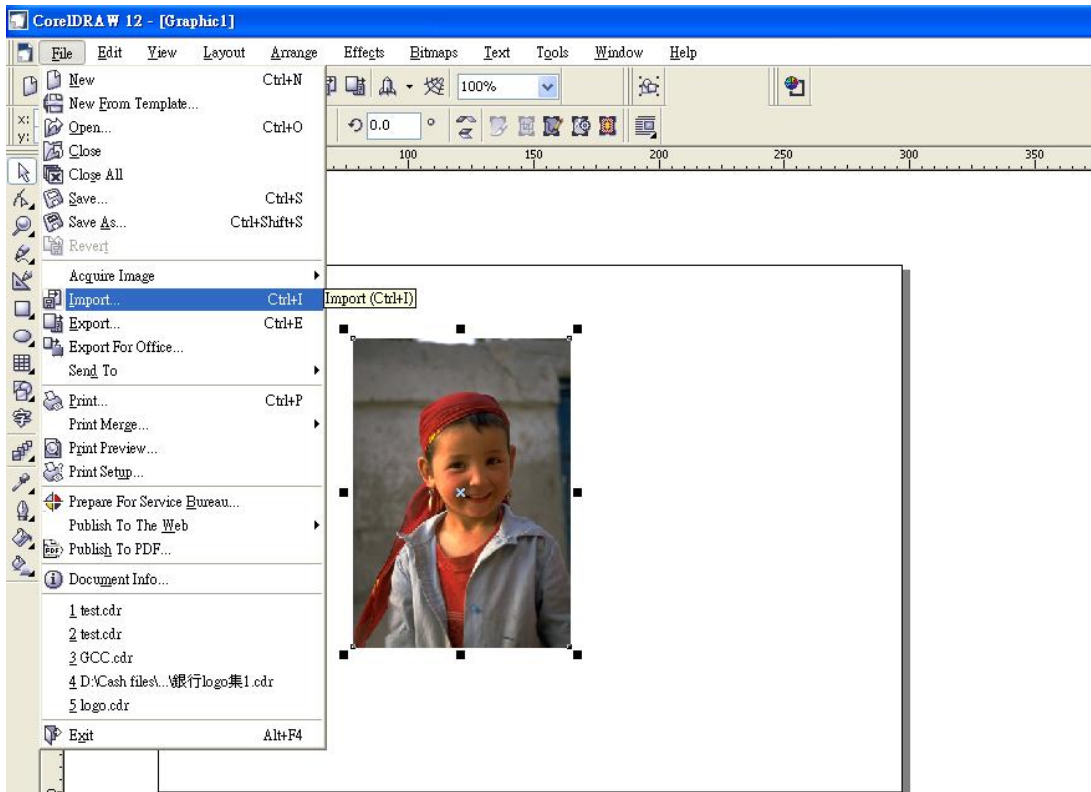
▲ Before cleaning   ▲ After cleaning

6.5 To Modified Image Settings of Picture for Better Quality

1. Connect your digital camera to the computer by USB cable.
2. Download the picture from the digital camera to the computer
3. Select the picture that you want to engrave.
4. Import the image from the folder where the picture is located by selecting File/Import

5. Convert the image to Bitmap by selecting the image and click on Bitmaps/Convert to Bitmap
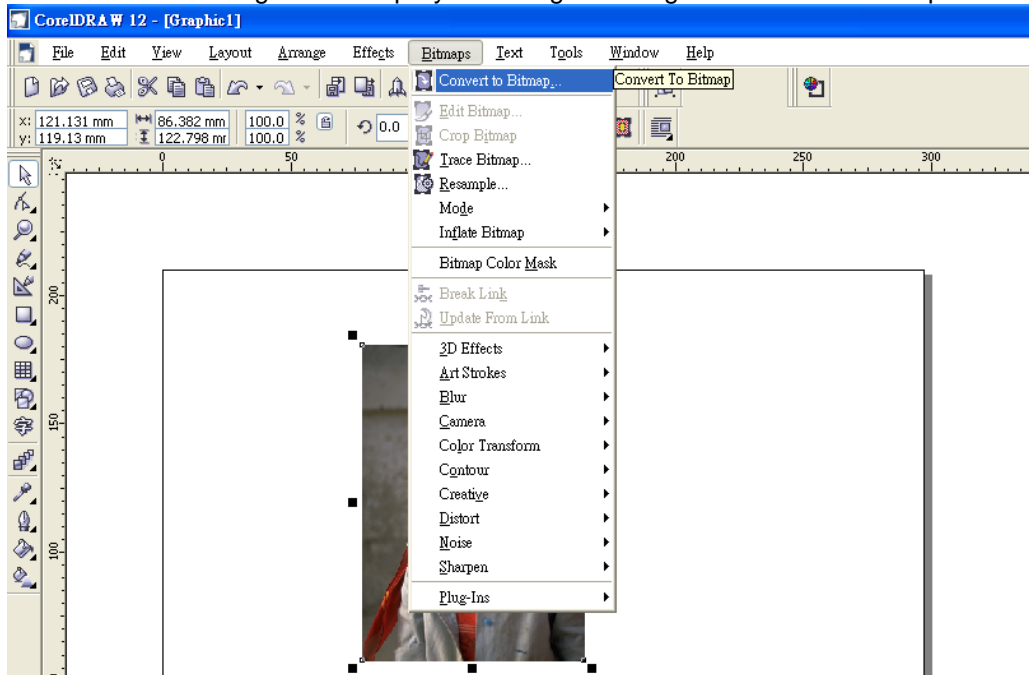
6. Change the Bitmap settings by setting "Color" to Grayscale (8-bit) and "Resolution" to 300 dpi and click OK.
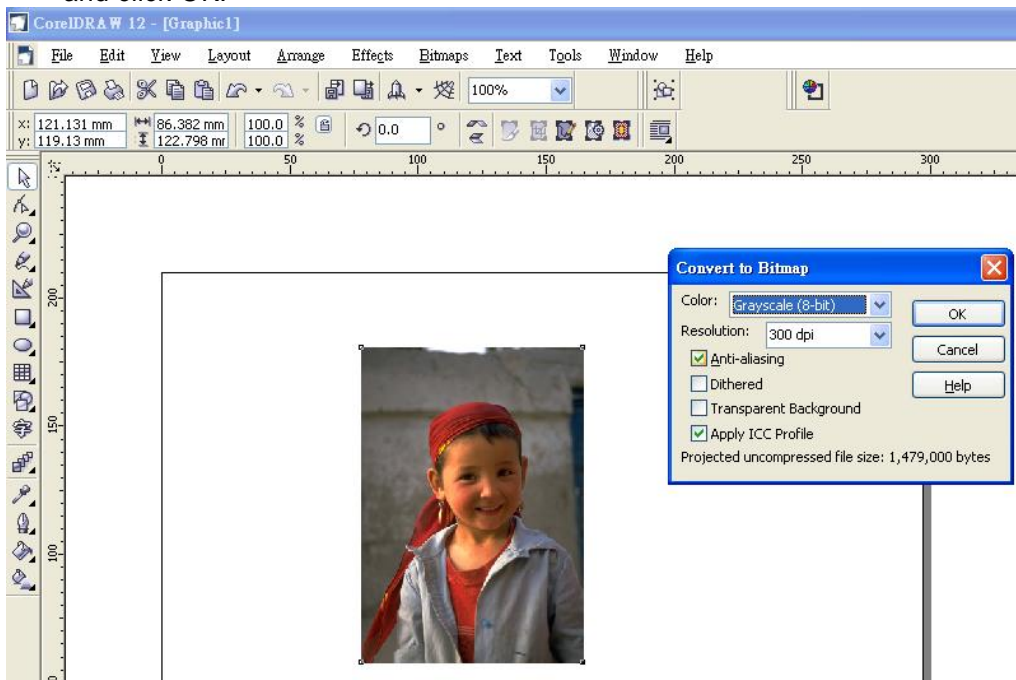
7. Finally, Invert the image by selecting Effects/Transform/Invert

8.   Now you are ready to output the modified image by clicking File/Print

Chapter VII - Optional Items

When purchasing the LaserPro X500 SERIES from your local authorized GCC distributor, you will be provided with a chance to purchase optional items to enhance your experience with your system. If anytime after the purchase o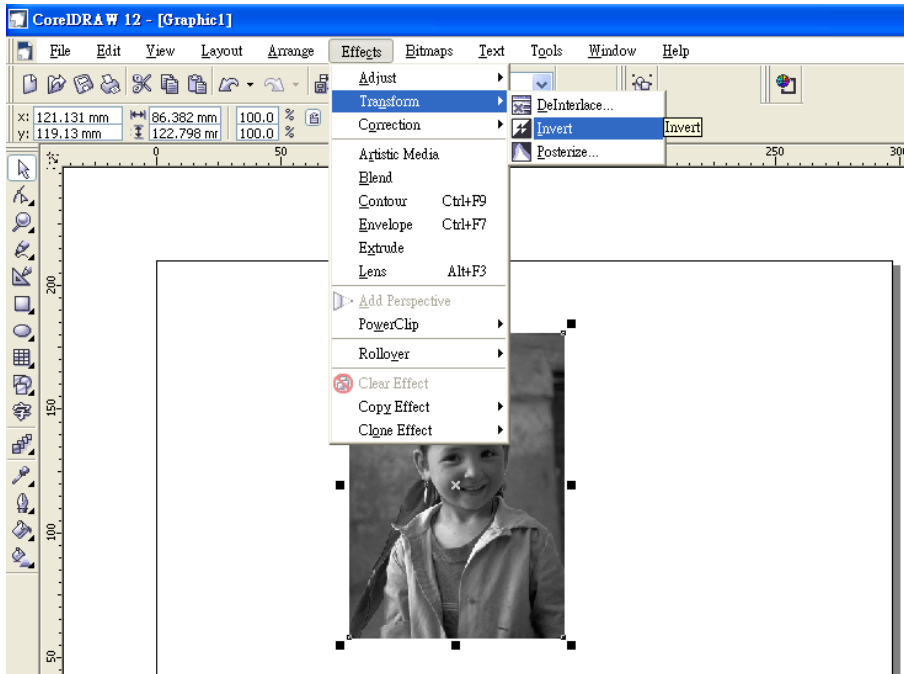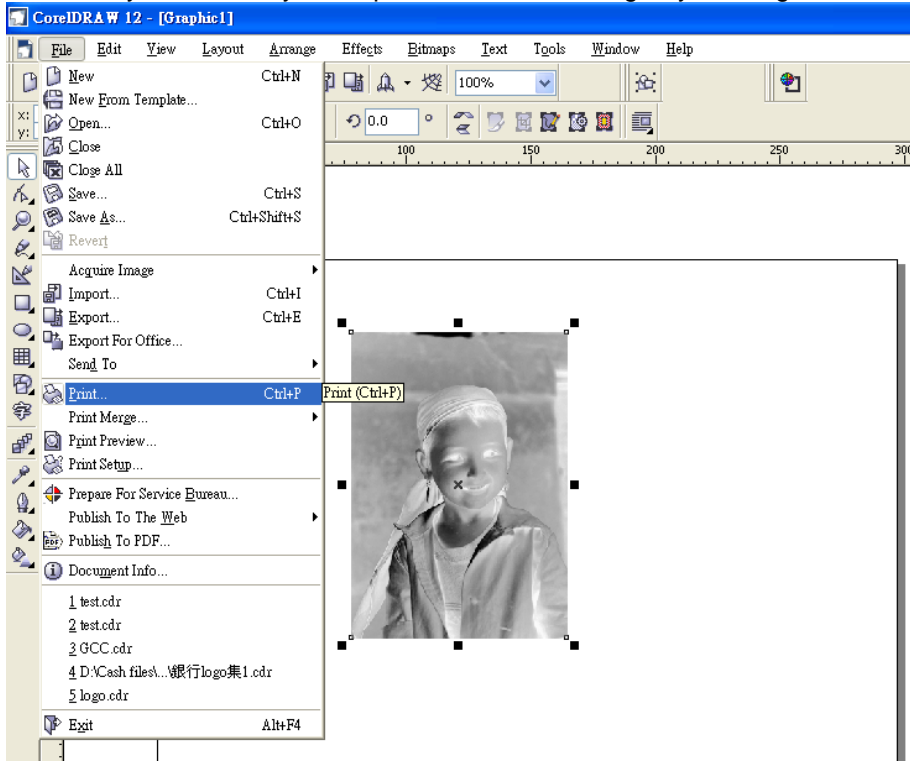f your LaserPro X500 SERIES, you would consider to purchase any optional item, please contact your local authorized GCC distributor.

7.1 Fume Extraction System Option

To properly remove dust, vaporized materials and chemical smoke from the working area and machine, it is necessary to install a suitable Fume Extraction system. The Fume Extraction system and other components are readily available from your local authorized GCC distributor or you can elect to purchase and install one yourself with components found at your local industrial supply store.

LaserPro's Fume Extraction Systems are specifically designed to prevent personnel from inhaling hazardous fumes and dust generated by the laser process. Available for all LaserPro engravers, the LaserPro Fume Extraction System represents the latest in fume extraction and odor reduction technology for all types of applications. Quiet operation, high vacuum capacity, compact design and long life expectancy are but a few outstanding features. Each LaserPro Fume Extraction System is powered by a maintenance-free, continuous-running turbine. In order to ensure personnel safety and legal compliance, the LaserPro Fume Extraction System is CE-compliant. To purchase a LaserPro Fume Extraction System, contact your local authorized GCC distributor.

INSTALLATION (Self-Assembled Unit)

1) Purchase an exhaust system at your local industrial supply store; we suggest that you have a contractor install the exhaust system. We highly recommend you install the exhaust system outside of the building for both noise considerations and if it does not possess filtering capabilities.

2) Mount the exhaust system in an obvious and accessible location, not too far from the LaserPro X500 SERIES, so it can be routinely switched on prior to laser engraving. The maximal distance you should mount the exhaust system away from the LaserPro X500 SERIES depends on the blower's vacuum capacity. We recommend that you consult with the vendor regarding the unit's vacuum force, maximal distances, based on the available models.

3) Connect rigid and smooth walled tubing such as PVC or sheet metal with an 8" diameter to the ventilation opening located on the rear side of the LaserPro X500 SERIES. Try to keep this tubing as straight as possible as bends reduce the exhaust efficiency. Use the appropriate sized tube clamps and sealants to ensure a tight and secure attachment.

4) We have added extra 4" dual hose connector with LaserPro X500 SERIES. For anyone who is not able to have 8" extraction system, we recommend that you should at least have two small extraction systems to provide better ventilation capability.

Exhaust Hose Connector

7.2 SmartGUARD Fire Alarm Option

Laser cutting and engraving operations using the SmartGUARD system protects the operator, machine, and the work products from potential fire hazards. During the engraving process, flaming may occur when working with combustible or easily-flammable materials, such as paper or wood. The SmartGUARD Fire Alarm is a pre-installed optional item that can be set to notify the operator through audio warnings and automatically shutdown the current operation. **Note that SmartGUARD is not a fire extinguisher, but a fire detecting and alarm system.**

INSTALLATION:

If you have purchased your system with the SmartGUARD option, then no installation is required, as your system will arrive with the SmartGUARD pre-installed.

For system owners that did not initially purchase this option, but would now like to add the SmartGUARD, then you will need to contact the local authorized GCC distributor to have this great feature installed. The installation process of the SmartGUARD fire alarm is complicated and not recommended to be performed by the end user.

OPERATION:

- **SmartGUARD:** Enable or Disable the SmartGUARD
- **Sensitivity**: The sensitivity of the SmartGUARD is adjustable. The user can select the delay time from 1 second to 9 seconds when a fire is detected until alarm activation and automatic system shutdown. As an example, if the firmware is set to 1 second, then the SmartGUARD fire alarm will alert and automatically shutdown the laser system 1 second after detecting a fire.
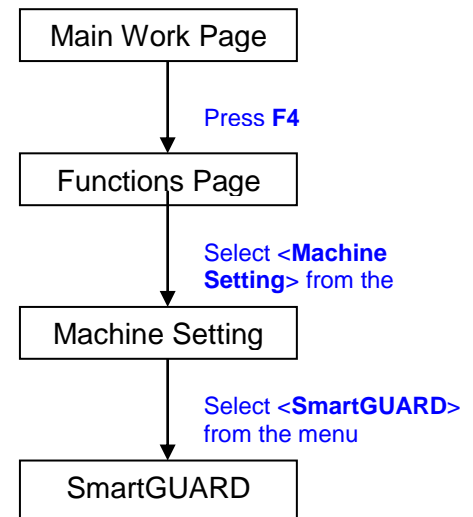
☼ **Navigating page:**


```
SmartGUARD :Enable
Sensitivity:1  sec
StowCarriage:YES

Back            Save
```

Main Work Page

Press **F4**

Functions Page

Select <**Machine Setting**> from the

Machine Setting

Select <**SmartGUARD**> from the menu
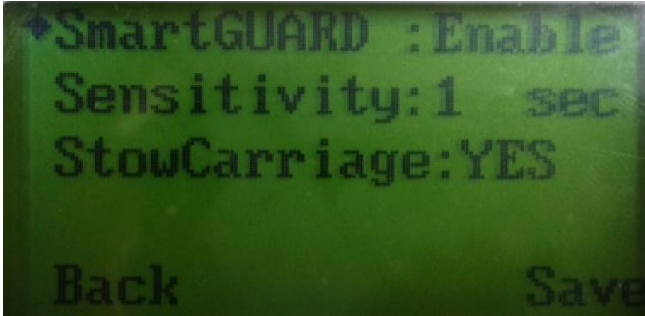
SmartGUARD

- **StowCarriage:** When set to "Yes", the lens carriage will move away from the source of the fire before automatic shut down.

> ⚠ *WARNING*
> Select disable it to disable the SmartGUARD fire alarm completely. The result is equivalent to not having the SmartGUARD fire alarm installed.

7.3 Honeycomb Table/ Aluminum Grid Cutting Table

The Aluminum Grid Cutting Table is an ideal pal for laser cutting, and the Honeycomb Table is especially good for cutting material into small pieces. They lift the work piece off the work table from hitting by laser reflection while supports it with reinforced aluminum grid design or honeycomb cells. The dust and vapor created during laser cutting are then taken away effectively through the grid by down vacuum exhaust funnel. Rather than handling rigid materials, aluminum grid cutting table also helps to fix flexible materials with the aid of down vacuum funnel to keep constant focus distance and consistent cutting result. A clean and better cutting quality is achieved from this technique.

INSTALLATION:
- There are three levels of cutting slot as indicated below. Place the Supporting Cutting Bars to the slot #2 for Aluminum Grid Cutting Table supporting purpose, and slot #3 for Honeycomb Table supporting.
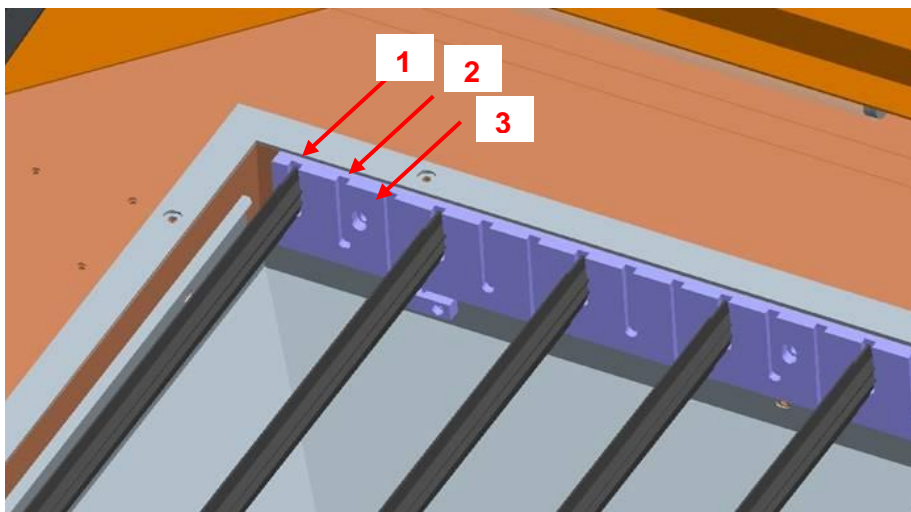
- More Supporting Cutting Bars will provide stronger support to the cutting table and work piece, place the Supporting Cutting Bars evenly underneath the work piece.

● Place the Honeycomb Table or Aluminum Grid Cutting Table over the arranged Supporting Cutting Bars.
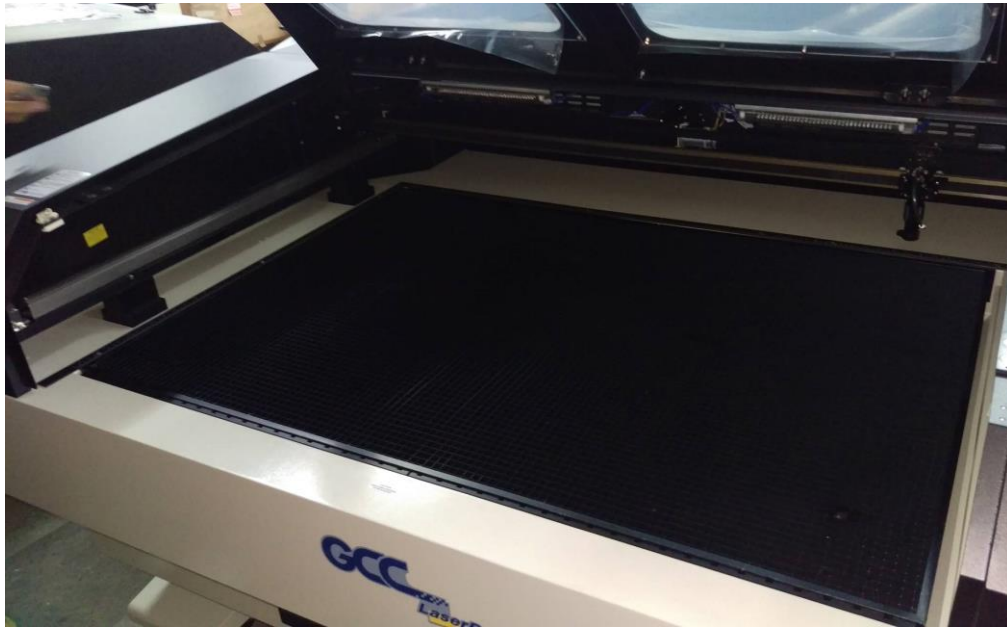
TIP

When doing thick cutting, cover the whole Aluminum Grid Cutting Table or Honeycomb Table with film on top to form a closed down suction then place spacers between the film and the cutting media will provide an optimum down vacuum resulting in good cutting quality by reducing flame.

OPERATION:
- Select the honeycomb option in the Paper page of LaserPro machine print driver when using the Honeycomb Table or Aluminum Grid Cutting Table.
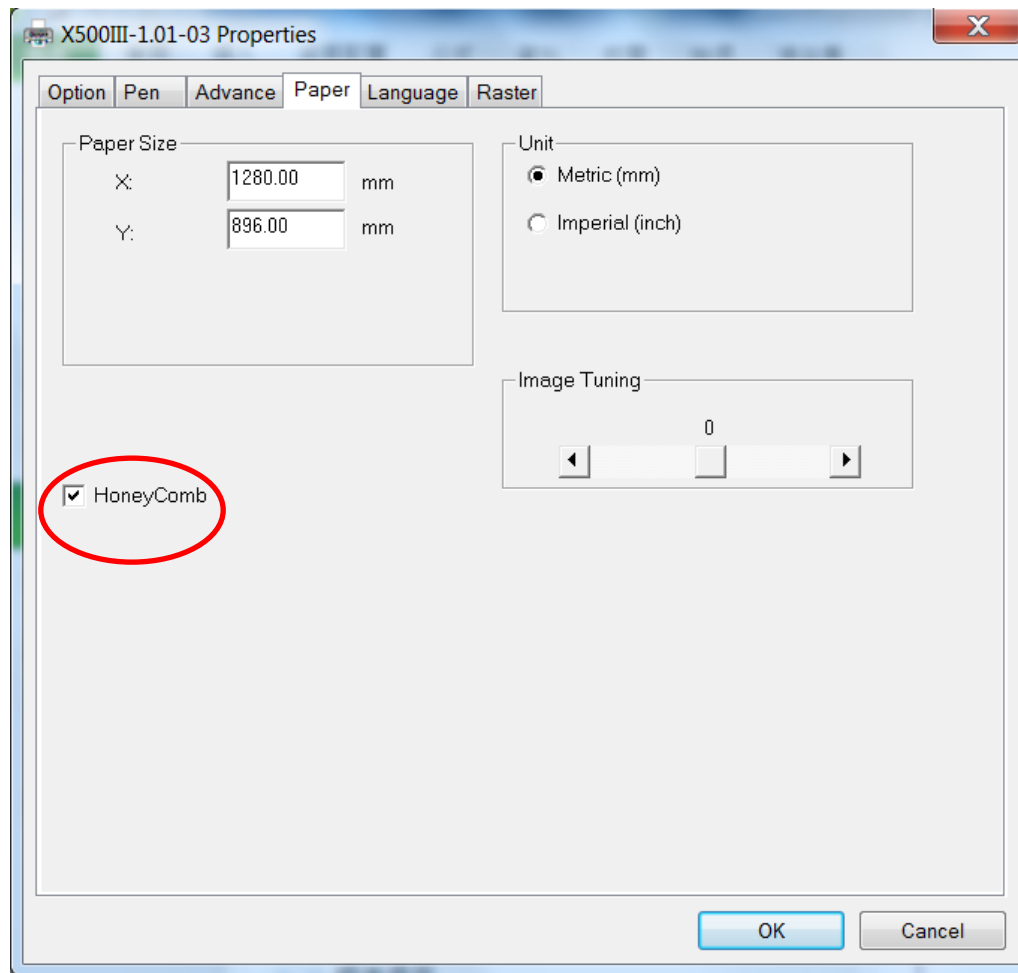
ⓘ *NOTE*

When the Honeycomb table is selected, the working area will be reduced to 1280mm x 896mm or 50.39"x 35.27" to fit the cutting table.

Chapter VIII Basic Maintenance

Keeping the optics and the motion system clean is essential to quality engraving and reliability of your machine. Recommend to clean the work table, moving rails, and optics on weekly base for normal usage case. This chapter provides information on basic maintenance that you should do to keep the machine in the best condition. It also includes a section on replacing the machine's laser module.

> ⚠️ **WARNING**
> - Electrical Shock may occur if you do not turn off and unplug the LaserPro X500 SERIES before cleaning.
> - Damage may occur to the system if you do not turn off and unplug the LaserPro X500 SERIES before cleaning.
> - Always turn off and unplug the LaserPro X500 SERIES before cleaning!

8.1 Suggested Cleaning and Maintenance Supplies

Cleaning / Maintenance Tool	Special notes
Soap Solution or All-Purpose Cleaner	
Paper Towels	
Cotton Cloth	
Denatured Alcohol	DO NOT use alcohol on any painted surface, plastic, or the laser system!
Acetone	ONLY to be used on the working table
Vacuum Cleaner with a Flexible Nozzle	Only to be used in and around the worktable and motion system
Light Grade Machine Oil	
Cotton Swabs	Supplied
Lens Cleaner	1pc supplied; suggest to search locally*
Lint Free Lens Tissue	Supplied
#2 Phillips Screwdriver	
Allen Wrench .050"	

*The recommended lens cleaner is Eclipse Cleaning System Solution from Photographic Solutions or HPLC grade Methanol. Search "Eclipse Cleaning System Solution" on Amazon or eBay to get the solution locally.

http://www.amazon.com/Photographic-Solutions-ECDCS-Cleaning-Solution/dp/B0000AUR1I

Eclipse Cleaning System

8.2 Routine Cleaning

8.2.1 Cleaning the inside of the system

Open the front cover, and the shoulder cover. Use a vacuum cleaner to clean the inside of the machine thoroughly.

8.2.2 Cleaning the work table and Motion System

Clean the working table and the motion system on a weekly basis through the following steps:

1) Turn the power off and unplug the laser machine before cleaning.
2) Use a vacuum cleaner with a flexible nozzle to remove dust and debris from the worktable, scrap drawer and motion system.
3) Apply small amounts of all-purpose cleaner, alcohol, or acetone to a paper or cotton towel to clean the working table.
4) Apply a soap solution, all-purpose cleaner, or alcohol to a paper or cotton towel to wipe down the rails of the motion system.
5) Wait for all cleaning residue to dry completely before plugging in and operating the laser system.

> ⚠️ **CAUTION**
> - Never pour or spray alcohol or acetone directly to the working table.
> - Oil, alcohol and acetone can cause fires or smoke build-up if improperly used.

8.2.3 Lubricate the motion system

In order to keep the motion system running smoothly, the X / Y rails of the motion system will need lubrication on a weekly basis. Use a small amount of light grade machine grease to a paper or cotton towel and apply to the rails.

> 💡 **TIP**
> - Always clean and lubricate the rails after working with materials that produce lots of debris (such as wood).
> - Too much oil applied to the X / Y rails will accelerate the build up of debris.

8.3 Mirrors and lenses

The mirrors and the focus lenses are the two components most likely to require cleaning periodically. Check these parts at least twice a week to see if they need cleaning.

8.3.1 Cleaning the mirrors

1) For mirror 1 that is located inside the door at the left hand side of the machine .
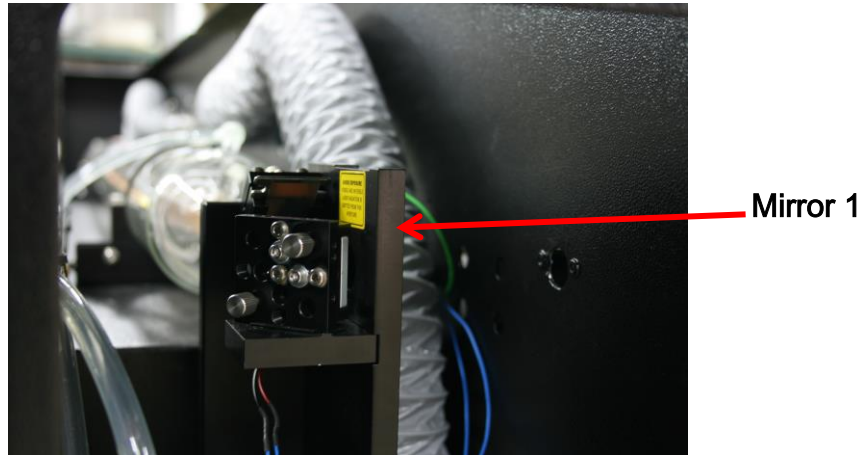
Mirror 1

2) For mirror 2, at the left hand side of working table, take the two screws off and remove the cover.

Mirror 2

Mirror 3

Focus Lens
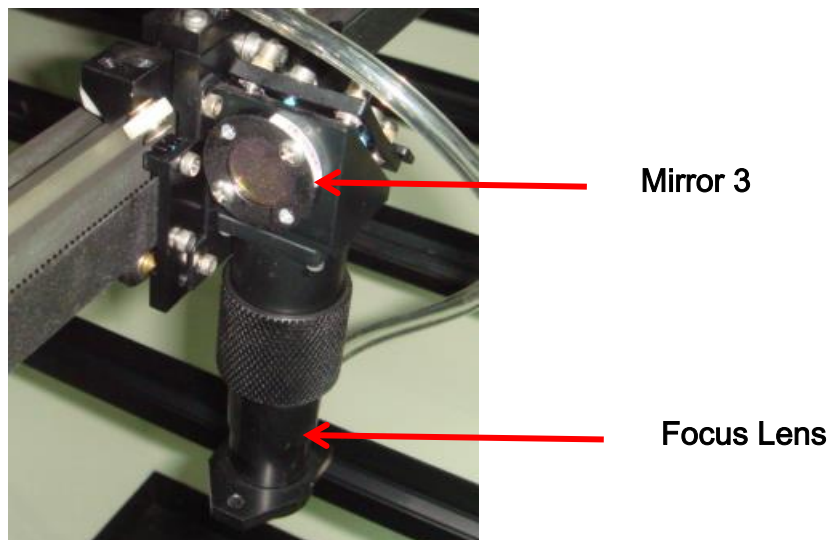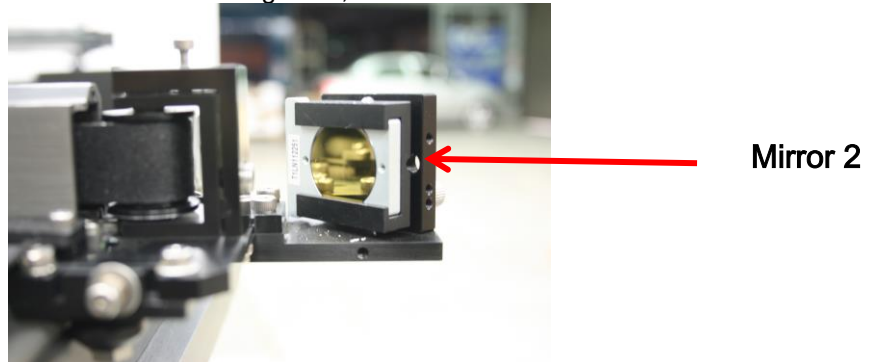
3) For mirror 3, at the top of carriage, take the two screws off and remove the cover.

Focus Lens

4) For mirror 1 and mirror 2, release the mirror securing screws and pull the mirror out carefully.
5) Use a rubber blower to blow away any dust from the surface of the mirror.
6) Put a lens tissue on the mirror and drop an little lens cleaner on the part of the tissue that covers the mirror

7) After the fluid has been absorbed evenly, pull the tissue one direction gently to clean the mirror

8) Allow the mirror to dry before re-installing it.

8.3.2 Cleaning the lens

1) Unscrew the air assist tube with screw driver
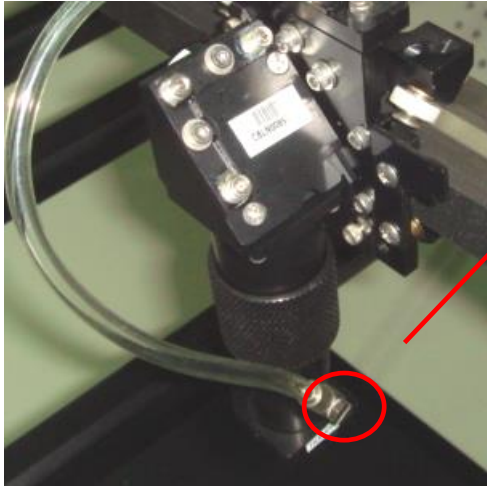
Unscrew the air assist tube with screw driver

2) Rotate the shaft to release the lens carriage
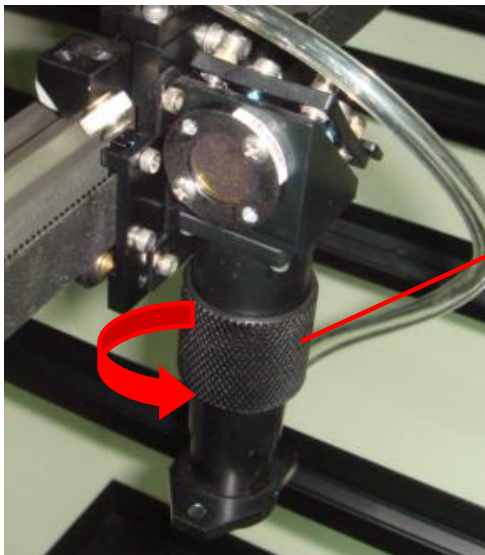
Rotate the shaft to release the lens carriage

3) Slide down the lens carriage to take out he air nozzle holder

Slide down to take out the air nozzle holder.

4) Clean the lens inside the nozzle holder with lens cleanser, and apply cotton swab or lens tissue to dry off the remaining solution gently.

5) If you want to take out the whole focal lens out for clean or replacement, utilize the " Focal Lens Removing Tool" in accessory box shown in below.
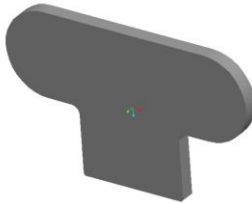
6) Fit the Focal Lens Removing Tool to the slots on the lens fixture and unscrew the fixture to take out the focal lens.

7) Handle the focal lens with lens tissue instead of touch with hand directly to prevent contamination.

Fit the Focal Lens Removing Tool here

> ℹ️ **NOTE**
> - Do not touch the surface of the lens with your fingers or press down hard with any cleaning material.
> - Once you finish cleaning and ready to reinstall the lens back in place, ensure the holes and corners match each other.

Chapter IX - Basic Troubleshooting

Quality Problems

- Check if the focal Lens is installed correctly or if focal Lens is not fixed properly.

- Check if it is caused by the debris or dust build up in the bearing tracks of x rail.

- Check if it is caused from the damaged or dirty focal lens and mirror 4 in the laser carriage which can not deliver the laser beam effectively.

Non-operational Problems

- **Laser beam does not generate**
  1) If the red alignment beam is not revealed, the laser beam is misalignment. Adjust reflection mirrors for exact focus.

  2) If the red alignment beam is revealed, please check the driver power. The laser power may be too low to be detected. Please increase the percentage setting of the Laser Power from the software driver or the control panel.

  3) Please check if the laser power connector is loose.

  4) For safety purposes, the laser beam will not be generated when the top or front door is opened.

  5) Check water level or temperature of the water cooler for LaserPro X500 SERIES.

> **NOTE**
> Unplug the machine before examining the mirrors, lens, motion system or any other part of the laser system.

Chapter X - Appendix

10.1 Glossary

Color Fill – Term within the awards and engraving industry used to describe the variety of techniques used to add color or contrast to engraving.

DPI – Dots Per Inch or Pixels Per Inch. The resolution of an image as defined by the amount of dots/pixels included in an inch. The DPI setting of 500, will include tell the machine to include 500 laser firings within an inch.

Driver – A software program that allows the computer to communicate with its components and peripherals: printers, scanners, monitors, etc.

Firmware – Programming permanently set into a computer's ROM chips. This information is burned into the computer chips and can only be changed by replacing the chips, or in the case of EEROM, by special procedure.

PPI – Pulses Per Inch. PPI determines the gross amount of laser pulses there will be per linear inch. PPI is exclusively for the vector setting. A PPI setting of 500 results in the laser firing every .002" (500 times per inch). If the standard lens is producing a vector laser focal point of .007", then higher PPI settings will result in deeper, overlapping laser pulses. PPI settings lower than 150 will result in the individual laser pulses being spread far apart, so they will not touch each other. Low PPI settings are a good example of perforate paper.

Vector – The process of cutting or engraving an image by using single horizontal, vertical and curved lines. For example: when cutting out or engraving the outline of a square, the vector setting will make the laser use a thin single line to follow the outline of the shape.

10.2 LaserPro X500 SERIES Specifications

X500III		80W	100W	130W	150W
Laser Source		Sealed CO2 Laser			
Laser Cooling		Water-cooled			
Work Area	without honeycomb table	51 x 36 in. (1300 x 916 mm)			
	with honeycomb table	50.3 x 35.2 in. (1280 x 896 mm)			
Max. Part Size (W x L x H)	w/o Cutting Table	52.9 x 36.0 x 2.1 in. (1346 x 916 x 55 mm)			
	Doors Open	52.9 x ∞ x 1.1 in. (1346 x ∞ x 30 mm)			
	With Honeycomb Cutting Table	48.8 x 32.2 x 1.1 in. (1240 x 818 x 30 mm)			
	With Aluminum Cutting Table	52.1 x 35 x 1.1 in. (1325 x 889 x 30 mm)			
Dimensions		74.8 x 55.1 x 47.2 in. (1900 x 1400 x 1200 mm)			
Driving Motor		Closed-loop DC servo control			
Maximum Speed*		40 IPS			
Speed Control		Adjustable from 0.1- 100% (Up to 16 color-linked speed settings per job)			
Power Control		Adjustable from 0- 100% (Up to 16 color-linked power settings per job)			
Engraving Capability		256-level gray scale image processing capability			
Z-Axis Movement		Manual			
Distance Accuracy		0.254 mm or 0.1% of move, whichever is greater			
Resolution (DPI)		Available 125, 250, 300, 500, 600, 1000			
Computer Interface		10 Base-T Ethernet, Full speed 2.0 USB			
Lens		standard 2", Optional 3"		Standard 3", Optional 2"	
Compatible Operating Systems		MS Windows			
Display Panel		4-line LCD panel showing current file name, total working time, laser power, engraving speed, file(s) loaded into memory buffer, setup and diagnostic menus.			
Cutting Table		Knife-shaped cutting bars with down vacuum and scrap collecting funnel			
Safety		Class I Laser Product Compliant with EN60825			
		Class II Laser Product Compliant with CDRH			
		2006/42/EC Machine Directive Compliance			
Facility Requirements					
Operation Electricity		200-240VAC, 50/60Hz auto switching, Max.10A			
Fume Extraction System		External exhaust system required to connect to 8-inch opening on machine (Air volume: free flow 1400 m3/h, static pressure 2700 pa)			

- Caution—Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

- Specifications are subject to change without prior notice.
- Speed is not equal to throughput. See dealer or visit *www.gccworld.com* for more details.