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LaserPro®
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C180

User Manual

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4F, No. 236, Fu-Te 2nd Rd., Hsi Chih, Taipei Hsien 221,Taiwan 886-2-6616-6692 Fax : 886-2-2694-6875

Distributed & Supported by: Jorlink USA, Inc. | Tel: (336) 288-1613 | support@jorlink.com | www.JORLINK.com

Dear Sir or Madam,

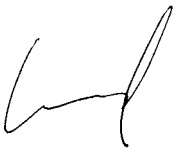
Thank you for choosing GCC and the LaserPro C180. You can be assured that this machine meets all of the highest safety standards while using technological innovations shared by no other laser engraver. The LaserPro C180 is backed by GCC, a truly international company that is dedicated to helping your business grow.

We at GCC are proud to introduce the LaserPro C180, 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™, stellar quality under high speed, SmartFILE file management, and the new Linear Low Maintenance Motion System, the C180 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.

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Chapter 1

Safety

1.1 Principles of a CO_2 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 C180 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. Although the laser tube itself is classified as a Class IV laser product. The laser system is designated as a Class I laser device, meaning that the system is equipped with key safety features and an enclosed laser head to completely contain the laser under normal use. One of the key safety features found on the LaserPro C180 is a Class 3R red dot safety guidance pointer (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 C180 is equipped with our most powerful laser to date, proper usage and hardware safeguards make it an extremely safe 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 unplugs the laser system and contact GCC technical support for service instructions.

* Internal LED Lighting is available on full version only.

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 inside of the machine and be visible in the event 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 outside of the machine.

In compliance with CDRH standards, the required warning labels are affixed at the time of manufacture to the LaserPro C180 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.

Product Label

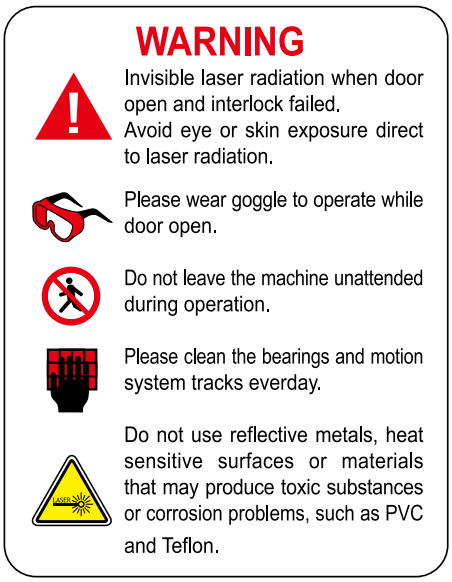
This label is located at the right-back side of machine. All the product information such as Serial Number, Model Numbers, Laser Power and Electric power can be found here. Before requiring any tech support, always provide service person the information on this label.

CDRH Label

This label indicates the class level of CDRH.

Warning Label

The warning label reminds operators to take precaution against possible mishaps during machine operation.

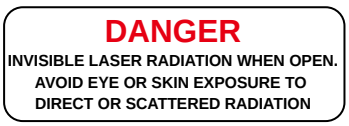


Laser Path Warning Label

LaserPro machines are very safe under normal use. Furthermore, Laser Path Warning Labels are displayed at the proximities of possible laser paths as a reminder. Operators should exercise caution when working close to these laser paths to avoid possible injury while machine is turned on.

Laser Path Danger label

This label indicates the laser path. Normally you can find this label inside of machine. Please be very careful of this area when you do the maintenance.



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 and engraving 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.

NOTE

SmartGUARD™ is an optional fire detection alarm system developed by GCC. Contact your local GCC authorized distributor for more details for having this safety option installed onto your system.

- Enable the SmartAIR™ nozzle when engraving or cutting materials that may easily ignite, such as acrylic, wood, or paper.
- Always wear safety goggles when the laser system is in operation. Reflective materials such as mirrors, enameled brass and anodized aluminum may partially-reflect some of the invisible laser radiation. Severe eye damage may occur if appropriate safety goggles are not worn.

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:

10,600 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 by products generated during the laser engraving and 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 a machine that 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 C180. Improper work environments may lead to operational malfunction and/or unsafe working conditions. The LaserPro C180 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 85°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 C180, an exhaust system, 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 85°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 the fume exhaust system.
- Set the LaserPro C180 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 at least 60 cm (2 feet) away from the wall.

NOTE

SmartGUARD™ is an optional fire detection alarm system developed by GCC. Contact your local GCC authorized distributor for more details for having this safety option installed onto your system.

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Chapter 2

Unpacking & Contents

Unloading and Unpacking

Contents and Accessories Checklist

2.1 Unloading and Unpacking

The LaserPro C180 & C180S 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

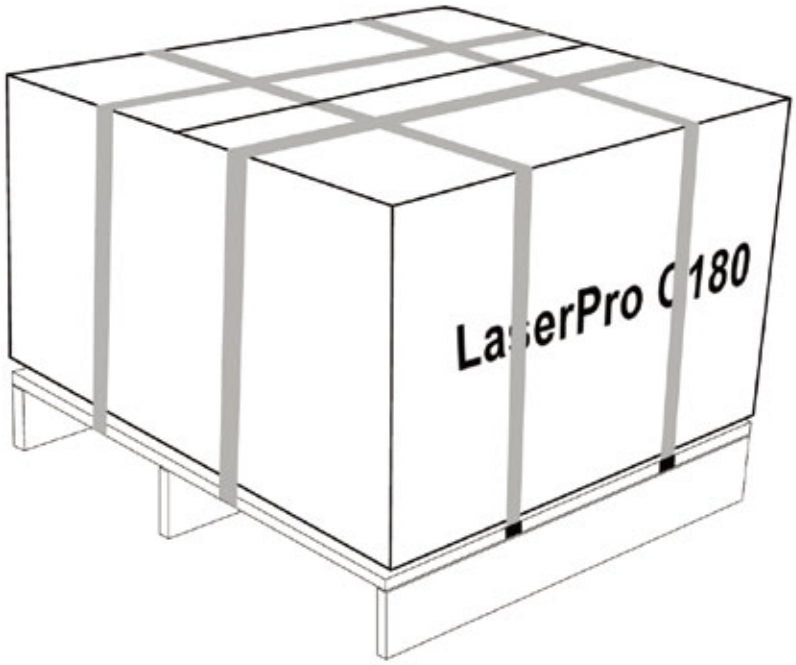
To prevent personal injury or damage to the machine, please obtain assistance when loading and unloading the shipping crate.

NOTE

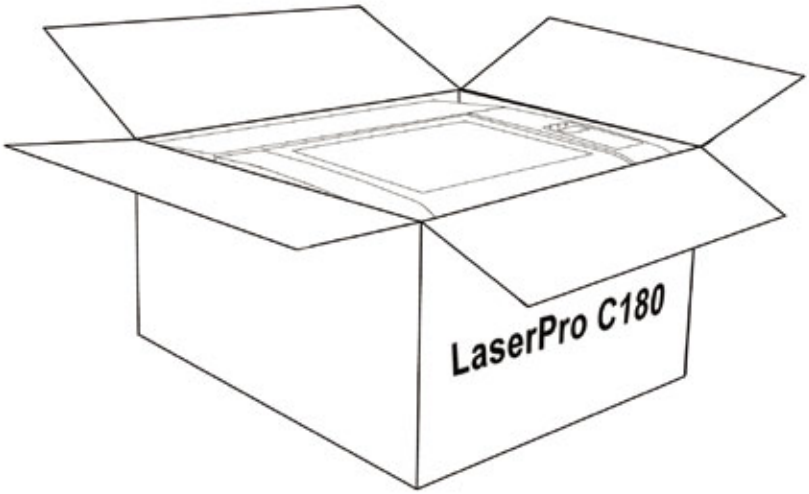
Please save the original shipping crate. If the machine must be returned for product servicing, it will need to be packed in its original shipping crate.

Unpack via the following steps:

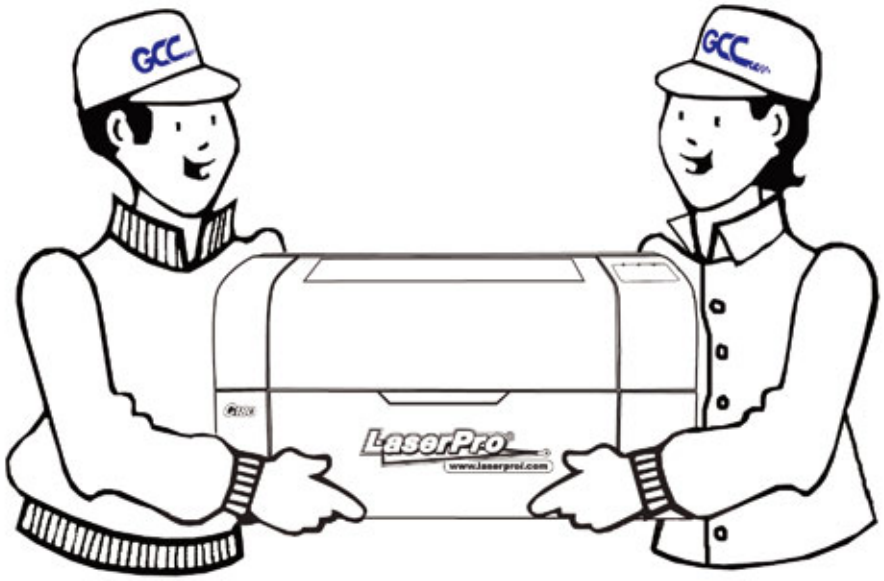
1) Move the shipping crate near the designated work area.
2) Remove the packing tapes.



3) Open the carton box.



4) Carefully lift the machine out of the box with the help of another person.



2.2 Contents and Accessories Checklist

Please check to make sure 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
Cleaning Kit	Cotton	1
	Lens Cleaner Solution	1
	Lens Tissue	1
Main Power Cord		1
Printer Port Cable		1
USB Port Cable		1
Focusing Tool		1
CO_2 # 900 Goggles		1
2 inch to 4 inch Hose Adaptor		1
2 inch tubing		1
Installation CD (LaserPro C180 user manual, driver, and firmware)		1
Pencil Sample		2
Butterfly Sample Card		1
Promise Card		1

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Chapter 3

Mechanical Overview

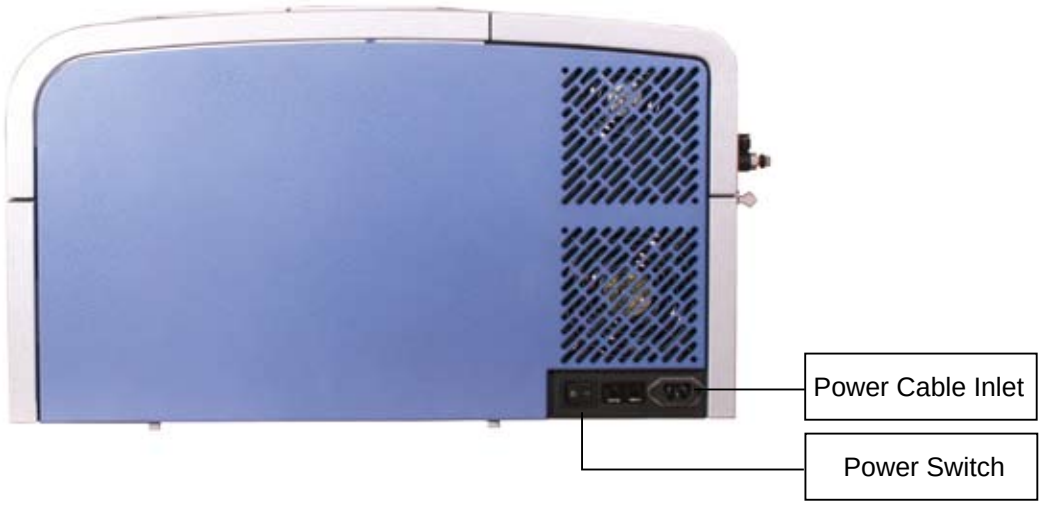
- Front View
- Top View
- Right (Profile) View
- Left (Profile) View
- Rear View
- Difference between C180 and C180S View

Please take some time to familiarize yourself with this section regarding the mechanical overview of the LaserPro C180 / C180S. References will be made back to the different parts of the LaserPro C180 / C180S in later sections.

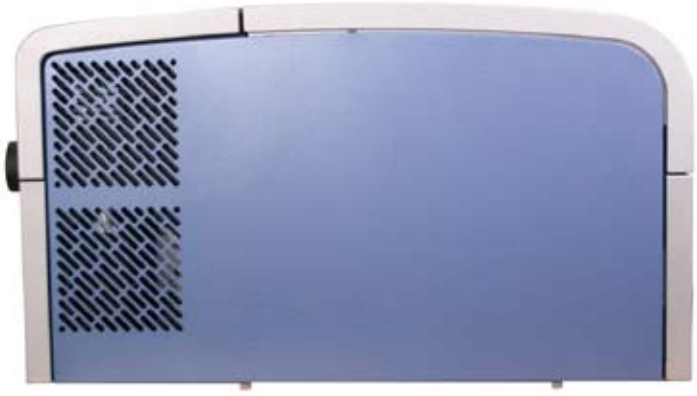
3.1 Front View

3.2 Top View

3.3 Right (Profile) View



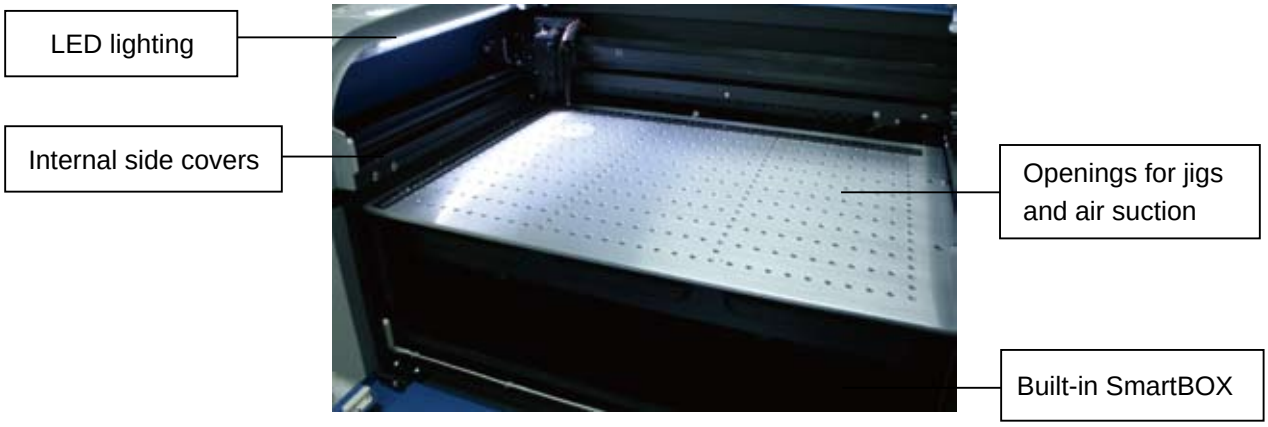
3.4 Left (Profile) View



3.5 Rear View

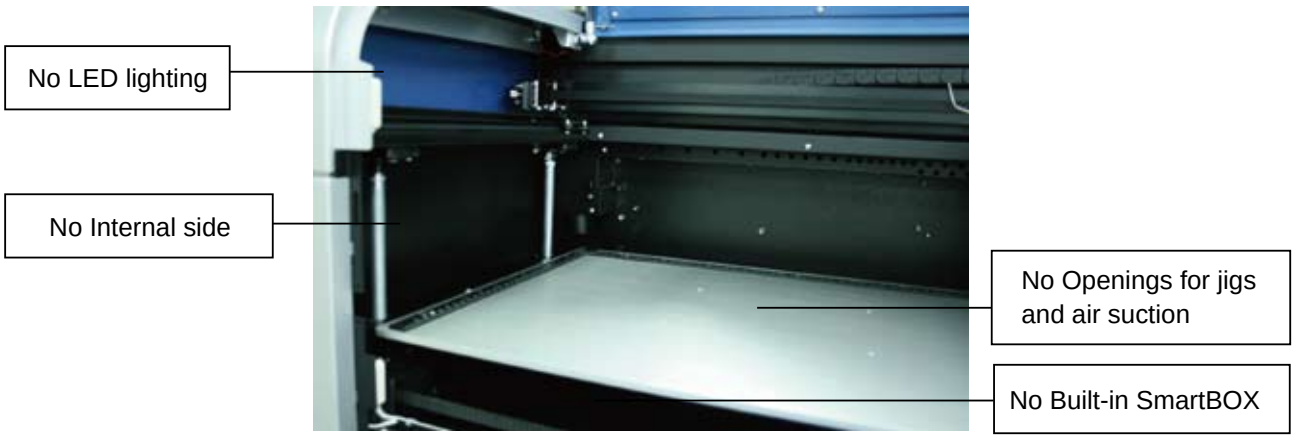
3.6 Difference between C180 and C180S View

- **C180**



*Note: Working platform can be removed from SmartBOX for extra 2" engraving depth allowing work done on 6" thick material.

• C180S



* Note: Without the SmartBOX, the maximum engravable depth of the object is 4".

4

Chapter 4

Setup and Installation

Machine Setup

- Powering Up the Machine
- Power Cable Connection
- Connecting the Computer

Graphics Software Setup

- Recommended Computer Configuration
- Installation of the LaserPro USB Driver
- Installation of the LaserPro Print Driver

4.1 Machine Setup

4.1.1 Powering Up the Machine

CAUTION

Make sure both the LaserPro C180 and computer are turned off before connecting either to a power source.

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

NOTE

The LaserPro C180 has been designed to automatically switch from 100~240 VAC.

Tip

Please adjust the LCD Display Screen's Contrast before plugging in the electrical cord of your laser. LCD adjustment wheel is located underneath the control panel.

4.1.3 Connecting the Computer

The LaserPro C180 can communicate with a computer through a USB Port or Parallel Printer Port connection interface. The USB Port connection offers faster file transfer rates and greater flexibility over the Parallel Printer Port connection. Regardless of the connectivity method chosen, you will need to connect the respective connection cable from the LaserPro C180 to your computer.

USB Connectivity: Connect the included USB Port Cable to the USB Port on the right side of the LaserPro C180.

Printer Port Connectivity: Connect the included Printer Port Cable to the Printer Port on the right side of the LaserPro C180.

NOTE

If you have purchased additional Optional Accessories for the LaserPro C180, please refer to chapter 7 for instructions on how to properly setup your optional accessories. These should be setup prior to working with your LaserPro C180.

4.2 Graphics Software Setup

The LaserPro C180 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 C180, but these are not 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.
- When you have the mass cutting production, we will suggest that you can select AutoCAD to work with the LaserPro C180 to have better output performance.

4.2.1 Recommended Computer Configuration

The LaserPro C180 operates under Windows operating systems and is designed to work on a computer that meets the following minimum requirements.

Personal Computer

- Hardware Compatibility
  - 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 Compatibility
  - The LaserPro C180 drivers are designed for Windows 2000, XP, or newer operating systems.

Macintosh Computer

- Hardware Compatibility
  - Mac OS X Leopard
  - At least 32 MB of actual RAM

■ Software Compatibility

- Adobe Illustrator MAC version CS2/CS3/CS4

Tip

When you are working with cutting production, we suggest that you use AutoCAD to work with the LaserPro C180 to have better output performance.

4.2.2 Installation of the LaserPro USB Driver

This section is only required for users that use USB connectivity. If you use the Parallel Printer Port connectivity, then you can skip this section.

NOTE

- Do NOT connect the USB cable to the PC before you have completed both the LaserPro USB driver and LaserPro print driver installation.
- Install the LaserPro USB driver BEFORE installing the LaserPro C180 print driver.
- This set of USB drivers are not the same as the native USB drivers for Microsoft Windows.

1) Turn on your computer and insert the LaserPro CD.
2) From the auto run menu, select **C180** → **USB Driver** to start the LaserPro USB Driver installation.
3) The LaserPro USB Driver installation program will update your Windows USB driver. When the notification pops up, select **Yes** to continue the installation.
4) Click "**Start**" to continue with the installation

NOTE

Window Vista USB Driver installation: The main purpose is to install USB Driver correctly under Window Vista.

OS	Vista
USB Driver Version	USB Setup1.12_01
Firmware Version	1.22_AAS

Fig: Vista Operation System

Installation Process:

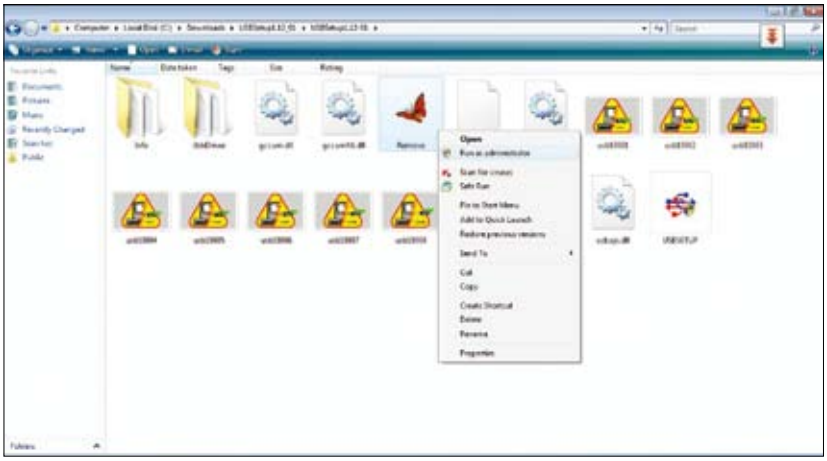
< Step1>

Download the latest USB driver

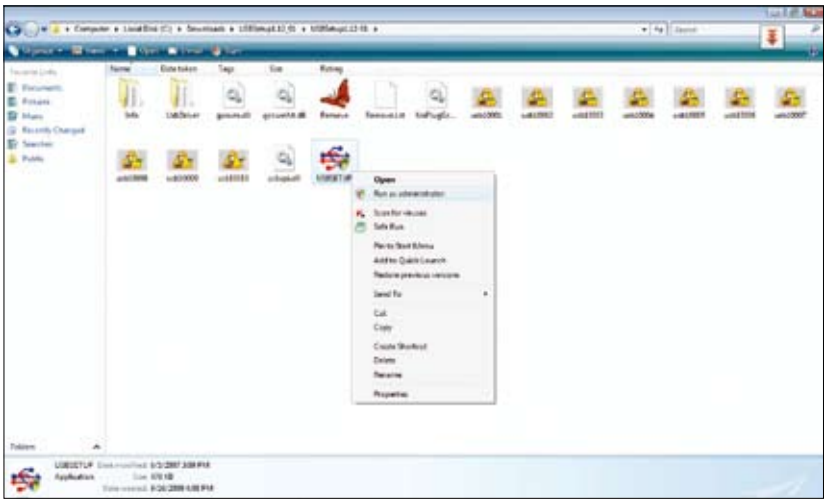
<Step 2>

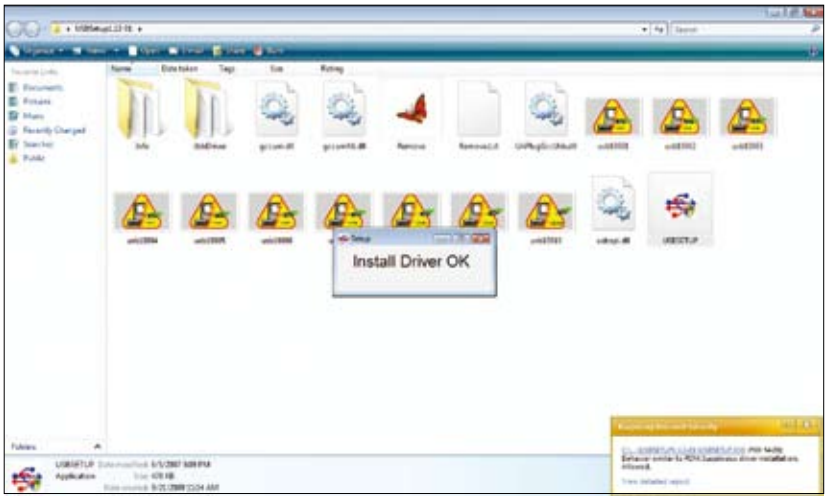
Please do the following steps to install the USB driver.

1. Run the remove.exe (right click and click ”Run as Administrator”) to make sure that we remove any previous versions of the USB driver.

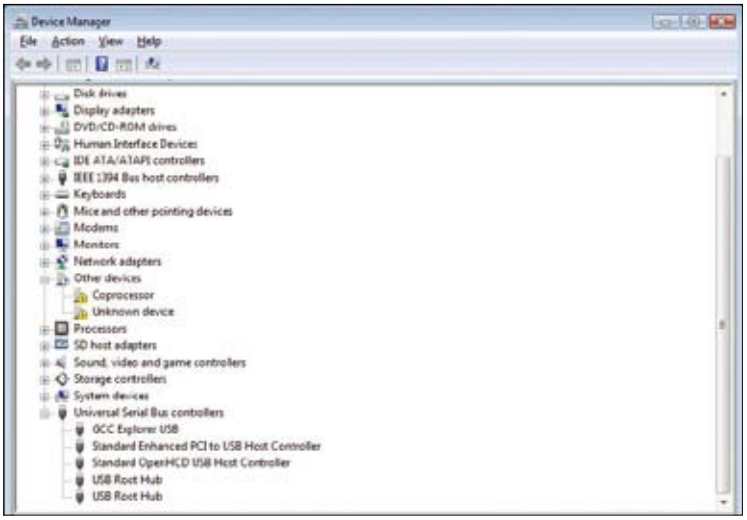


2. Run the “USBSETUP.EXE” file (right click and click ”Run as Administrator”)





3. Double check if the GCC USB driver has been installed correctly by going to the “Device Manager ”and locate the “Universal Serial Bus Controllers”)



- Attention: Remove previous installations if any. (Right click on previous installations and select remove driver, then unplug and plug USB cable from laser engraver again.)

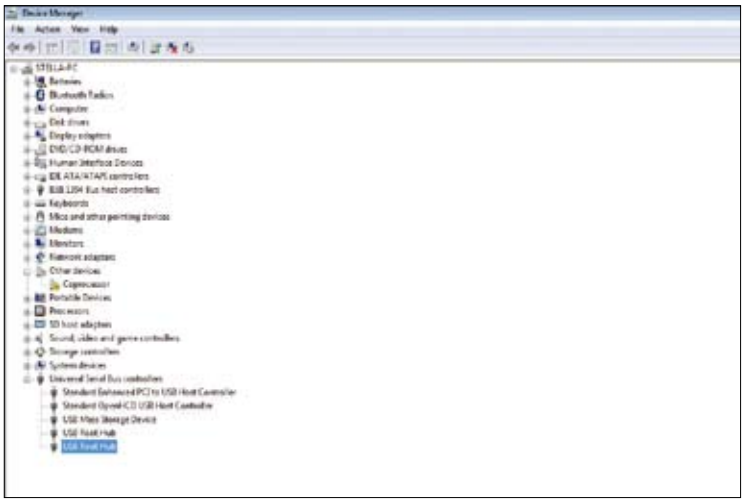
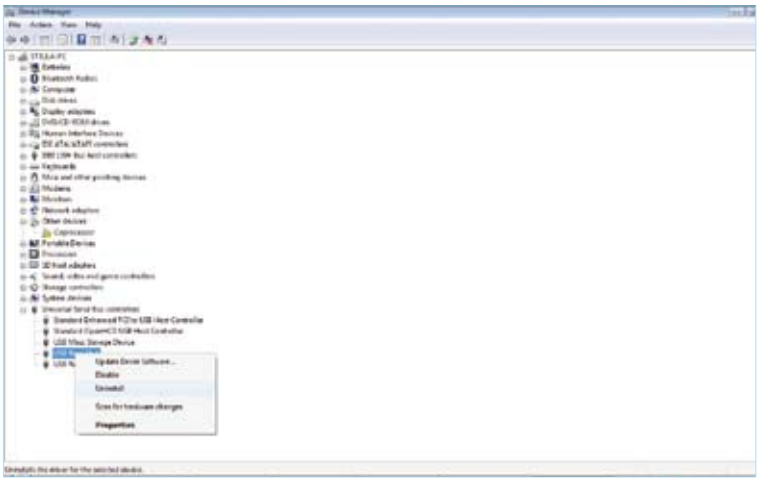


Fig: If the USB Print Support has been installed on the computer, it will be shown on the above screen



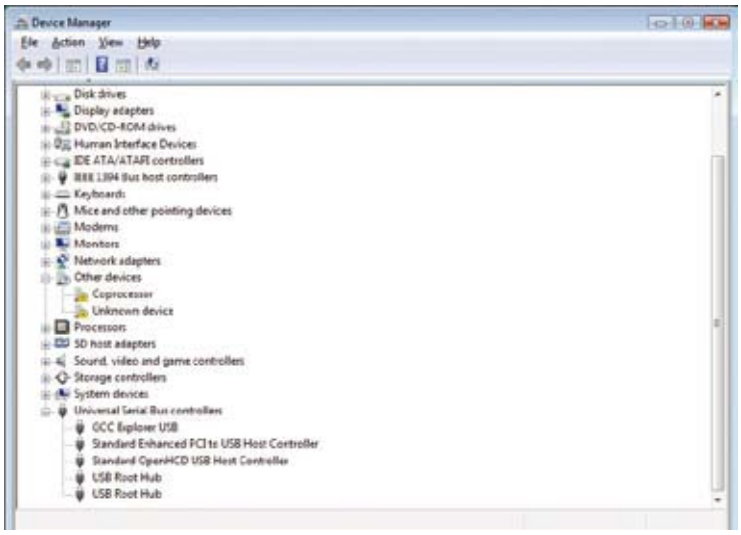


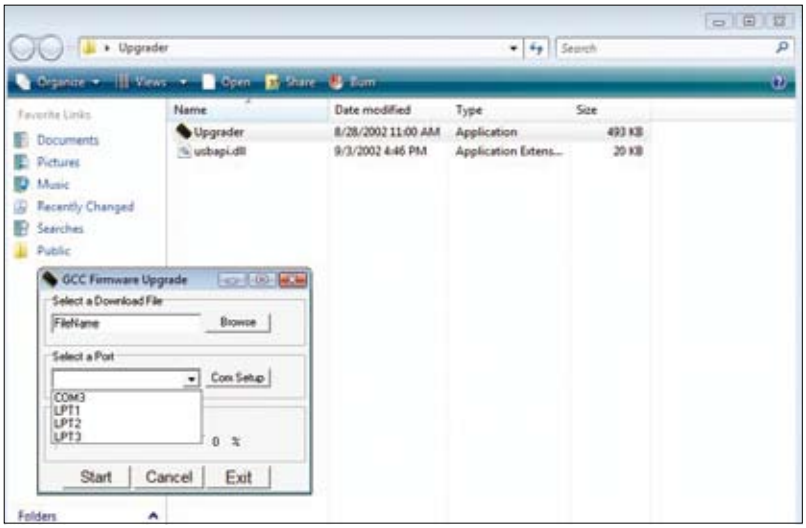
Fig: Unplug and reconnect the USB cable and the " GCC USB Driver" icon will be shown.

NOTE

Installation of "Upgrader.exe" under Win Vista: Even if the GCC USB has been installed correctly, it will still not work correctly when you are not logged in as an administrator to run the "Upgrader.exe" file.

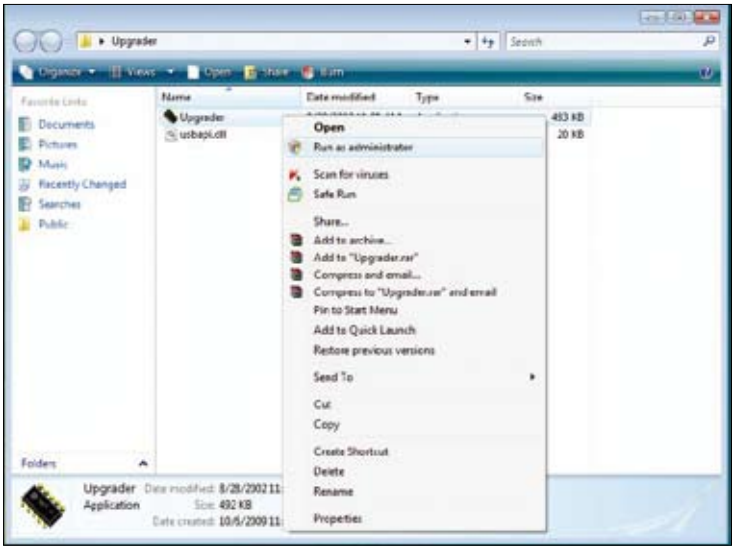
Example 1:

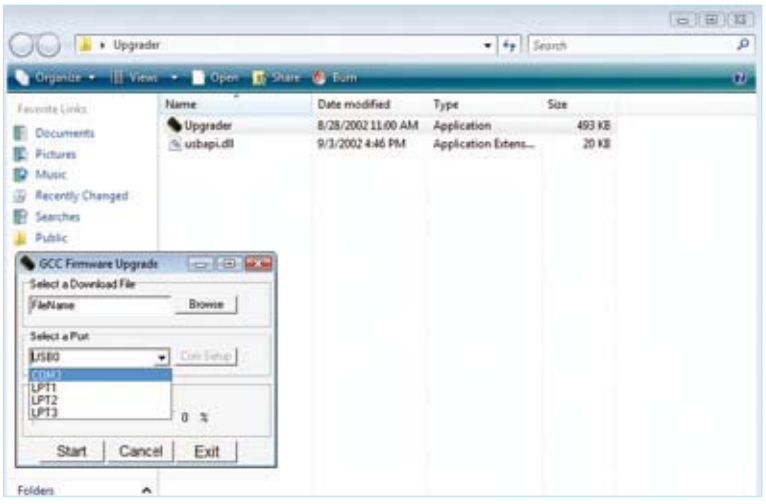
If we run the "Upgrader.exe" file but did not use "Run as Administrator". The GCC USB driver port will not show up in the pull down menu of the Com Setup.



Example 2:

Under the same situation as sample 1, right click on the "Upgrader .exe" and click" Run as Administrator", you can see the GCC USB Port in the pull down list of the Com Setup.





4.2.3 Installation of the LaserPro Print Driver

1) Insert the LaserPro CD.
2) From the auto run menu, select **C180** → **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 C180 will be attached 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 locate the GLxxx.inf file on the installation CD (xxx are numbers representing the driver version). Click **OPEN** to have C180 displayed as a valid printer.
7) Now select C180 from the list of printers (The C180 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 <C180> 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 C180 Print Driver within your graphics software, you will need to have the C180 set as the default printer to get proper output. If you select to not have the C180 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 C180's USB connection interface, then you will need to go to your Windows → Control Panel → Printer and Faxes. Right-click on the LaserPro C180 listing, and select properties. Go to the Ports menu and place a check next to GCC USB0, then click **OK**.

5

Chapter 5

Operating the LaserPro C180

Using the Hardware

- Adjusting the LCD Display Screen's Contrast Setting
- Graphic Control Panel Overview (Description)
- Graphic Control Panel Navigation Chart
- Graphic Control Panel Function Pages

The LaserPro C180 Print Driver

- Page Setup and Orientation
- Color Management
- Using the LaserPro C180 Print Driver
  - LaserPro C180 Print Driver >> Options Page
  - LaserPro C180 Print Driver >> Pen Page
  - LaserPro C180 Print Driver >> Advanced Page
  - LaserPro C180 Print Driver >> Paper Page
  - LaserPro C180 Print Driver >> Language Page
  - LaserPro C180 Print Driver >> Raster Page
  - LaserPro C180 Print Driver >> Stamp Page

Once you have installed the LaserPro USB Driver (USB connectivity only), LaserPro Print Driver, and have connected the LaserPro C180 to your computer, you will need to familiarize yourself with the LaserPro C180's 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, perform auto / manual focusing, configure the start point, and more.

5.1 Using the Hardware

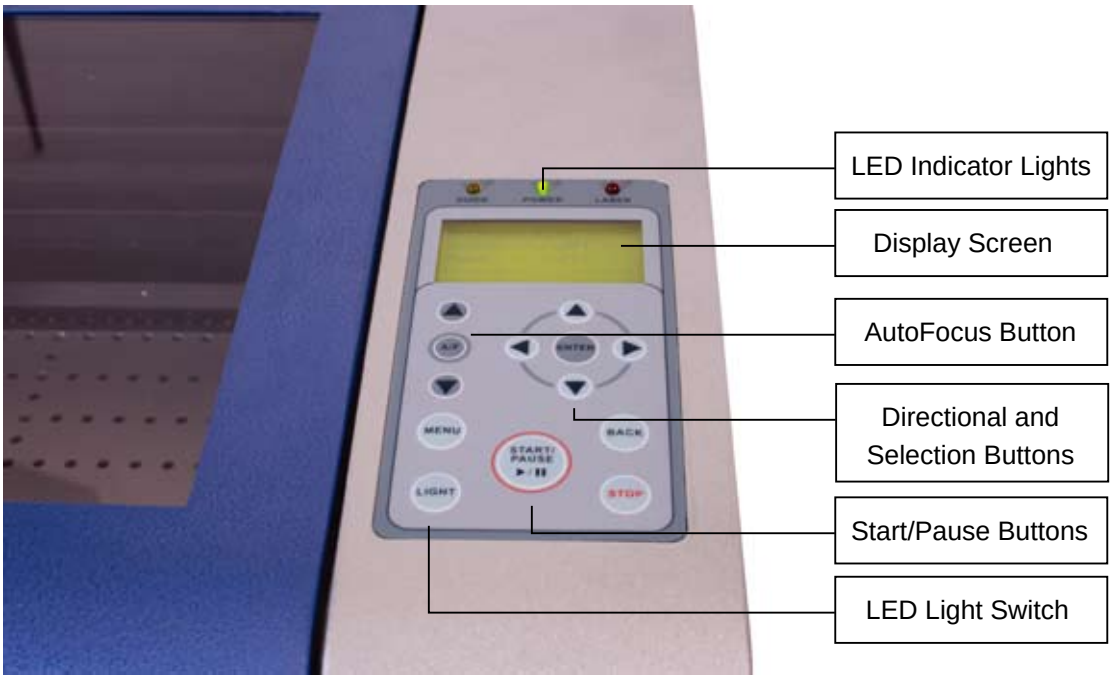
5.1.1 Adjusting the LCD Display Screen's Contrast Setting

Depending on the lighting of your immediate work area, you may need to adjust the LCD display screen's contrast. You may increase or decrease the display screen's contrast via the contrast adjustment wheel found on the inside of the front cover on the bottom, right side. You can access this area by opening the top window and looking inside to the near, right side of the work area (as shown in the picture below).

5.1.2 Graphic Control Panel Overview (Description)

The Control Panel

The control panel on the LaserPro C180 provides easy access to all of the manual controls needed for cutting and engraving. The liquid crystal display (LCD), 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 C180'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 C180 are open or improperly closed.
- **POWER** - The power light will illuminate when the LaserPro C180 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 operate the laser system if any component of the safety system is malfunctioning.

NOTE

There is an 8 seconds warm up period after the door LED is triggered for systems equipped with Synrad laser tubes. i.e. opening the top lid or the external pass through doors of the machine. Operator must wait for 8 seconds before the laser tube can begin to work.
A 40 seconds laser warm up period is required after the machine is turned on. A warning will be displayed if the users tries to run a job during the 40 seconds warm up time.

DIRECTIONAL AND SELECTION BUTTONS

Directional (△ / ▽ / ◁ / ▷) - 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 △ / ▽ directional buttons cycle through the various selections, while the ◁ / ▷ directional buttons adjust the value of that particular selection.

Enter – Confirms the current selection.

Start / Pause – Allows you to start/pause/restart the engraving jobs, once those jobs have been successfully loaded onto the system.

Stop – Stops the current job.

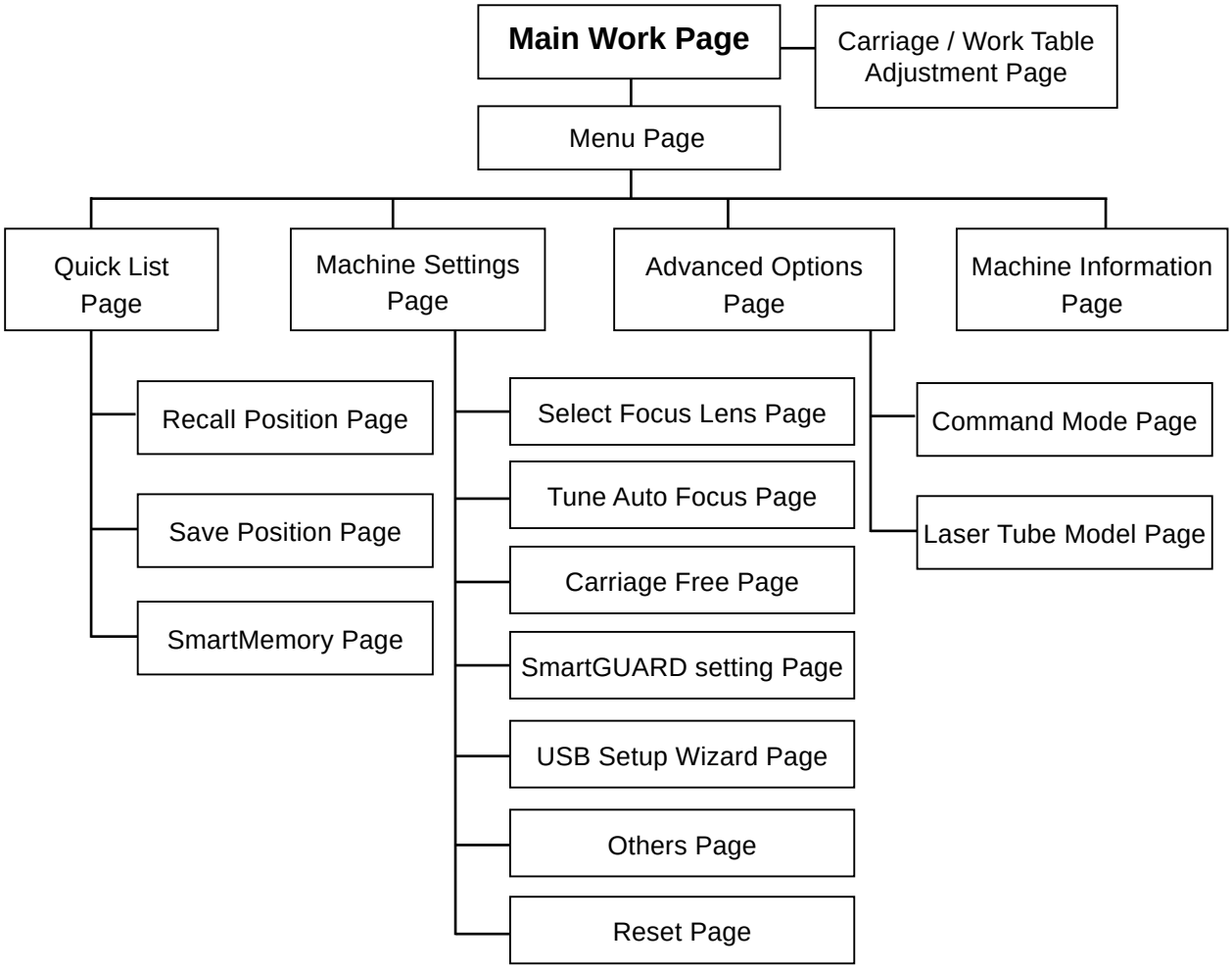
Back – Returns to previous screen.

Light – Turn light on/off.

Auto Focus – After pressing this button, the system will automatically adjust the optimal vertical focal distance for the laser.

Manual Focus (▲ / ▼) – To manually adjust the vertical focal distance between the laser head and the material, you can use the ▲ / ▼ buttons to do so. Doing so will adjust the vertical height (z-axis) of the worktable.

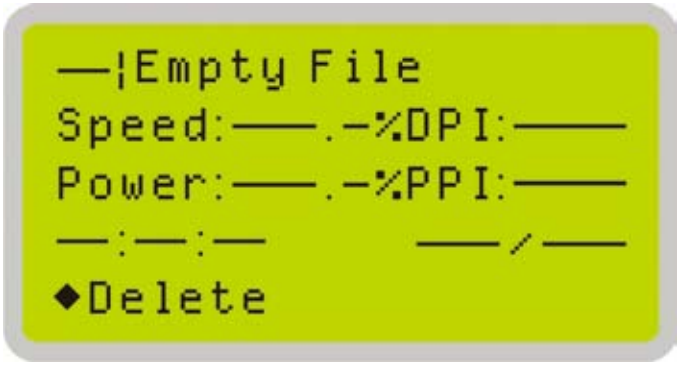
5.1.3 Graphic Control Panel Navigation Chart



5.1.4 Graphic Control Panel Function Pages

When the LaserPro C180 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.

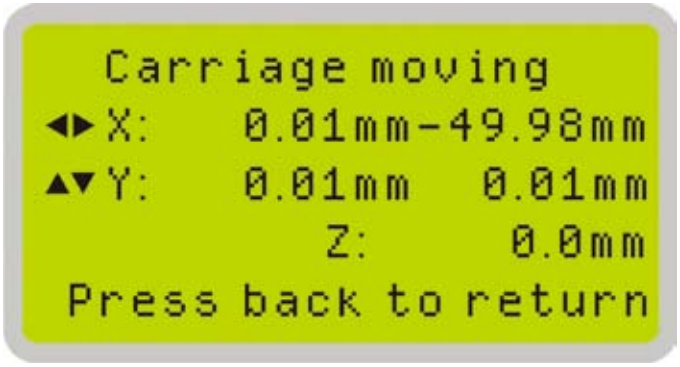
Main Work Page



The main work page is the page that the LaserPro C180 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**
△ / ▽ Directional	Scroll through previous and next jobs
◁ / ▷ Directional	Enables move Carriage page
Enter	Selects the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Start / Pause/ Restart the current job
Stop	Cancels the current job
Back	Go to previous screen
Light	Turn Light On/Off

Carriage / Work Table Adjustment Page



Navigating to this page:

Main Work Page

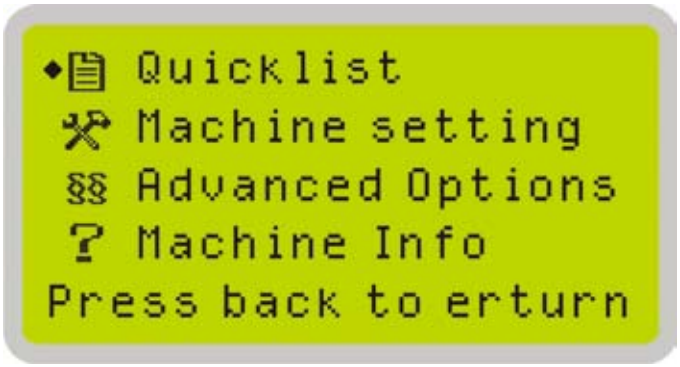
↓ Press ◁,▷

Carriage / Work Table Adjustment Page

The Carriage / Work Table Adjustment Page allow you to manually increase and decrease the height of the work table (Z-axis). In addition, you can manually adjust the Y-axis and X-axis of the laser carriage.

Carriage / Work Table Adjustment Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Manually adjust the Y-axis position of the laser carriage
◁ / ▷ Directional	Manually adjust the X-axis position of the laser
Enter	Selects the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Back to Main Work Page
Stop	Back to Main Work Page
Back	Back to previous screen
Light	Turn Light On/Off

Menu Page



Navigating to this page:

Main Work Page

↓ Press Menu

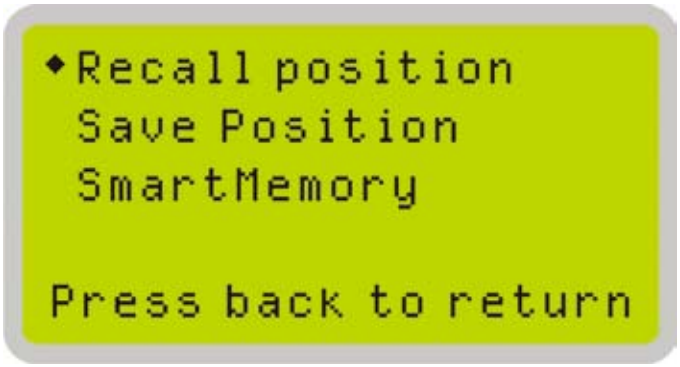
Menu Page

The Menu Page allows you to access the Quicklist functions, Machine settings, Advanced Options, and Machine Info.

- **Quicklist Page** – this page allows you to access frequently used functions such as Recall Position, Save Position, SmartMemory.
- **Machine Setting Page** – this page allows you to access and modify a variety of your machine settings, including: Select Lens, Tune Auto Focus, Carriage Free, SmartGUARD, USB Setup Wizard, Others, and Reset.
- **Advanced Options Page** – this page allows you to access and modify a variety of your machine settings, including: Command Mode and Laser Tube Model.
- **Machine Information Page** – this page allows you to view information regarding the system such as the GCC logo, machine model, firmware version, and other information.

Menu Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll through options
◁ / ▷ Directional	No Action
Enter	Selects the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Quicklist Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

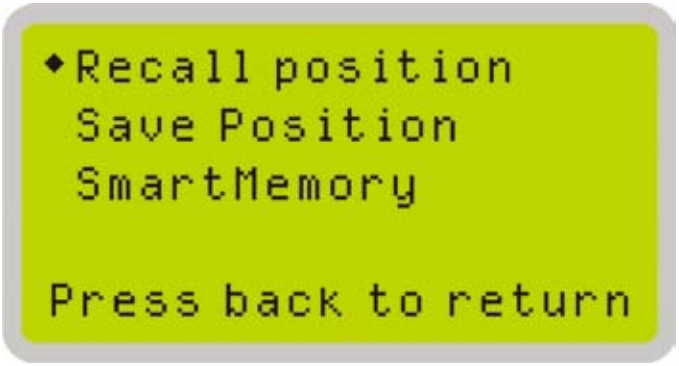
↓ Select <Quicklist> from the menu

Quicklist Page

The Quicklist Page allows you to access the Recall position, Save position, SmartMemory functions.

Quicklist Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll through options
◁ / ▷ Directional	No Action
Enter	Selects the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Recall Position Page



Navigating to this page:

Main Work Page

↓ Press F4

Menu Page

↓ Select <Quicklist> from the menu

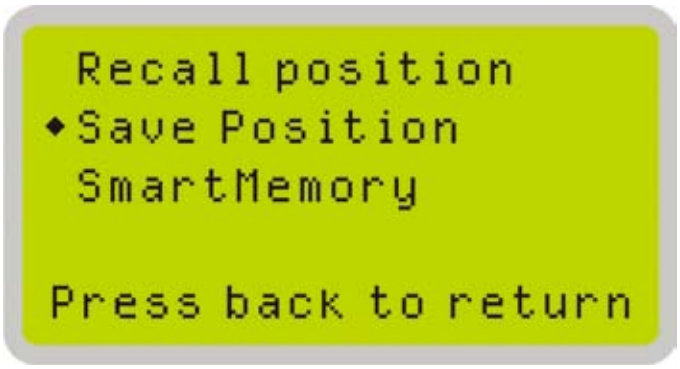
Quicklist Page

Select <Recall Position> from the menu

The Recall Position function will move the lens carriage to the position saved by using the Save Position function.

Recall Position Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll through options
◁ / ▷ Directional	No Action
Enter	Selects the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Save Position Page



Navigating to this page:

Main Work Page

↓ Press F4

Menu Page

↓ Select <Quicklist> from the menu

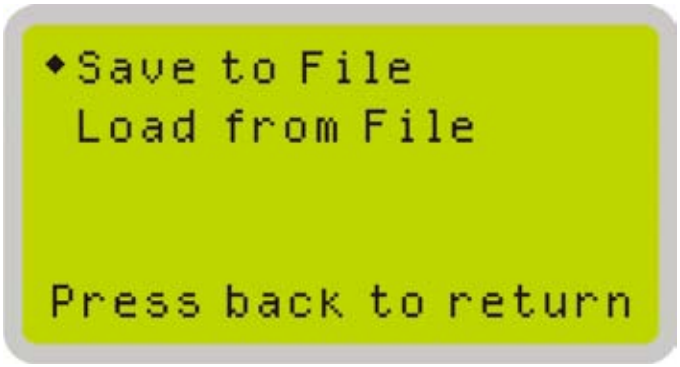
Quicklist Page

Select <Save Position> from the menu

The Save Position function will store the current position of the lens carriage and the position can be recalled by using the Save Position function.

Save Position Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll through options
◁ / ▷ Directional	No Action
Enter	Selects the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

SmartMEMORY Page



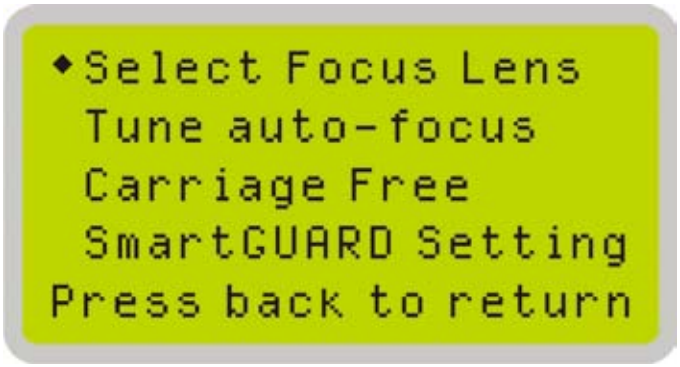
Navigating to this page:

Main Work Page
↓ Press Menu
Menu Page
↓ Select <Quicklist> from the menu
Quicklist Page
↓ Select <Save Position> from the menu
SmartMEMORY Page

The SmartMEMORY Page allows you to read and write data with the optional SmartMEMORY module installed. Selecting <Save to File> will copy all current jobs on the LaserPro C180 to the SmartMEMORY module. Selecting <Load from File> will copy all job files from the SmartMEMORY module to the LaserPro C180.

SmartMEMORY Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll through options
◁ / ▷ Directional	No Action
Enter	Selects the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Machine Settings Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

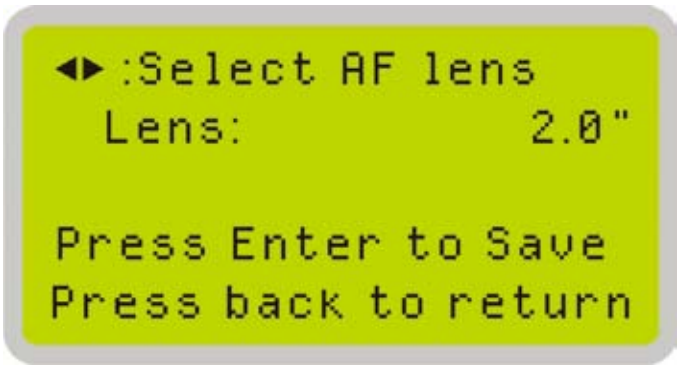
↓ Select <Machine Setting> from the menu

Machine Setting Page

The Machine Settings Page allows you to access and modify a variety of your machine settings, including: Set Focus Lens, Tune Auto Focus, Carriage Free, SmartGuard, USB Setup Wizard, Others, and Reset.

Machine Settings Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll through options
◁ / ▷ Directional	No Action
Enter	Selects the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Select Focus Lens Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

↓ Select <Machine Setting> from the menu

Machine Setting Page

↓ Select <Select Focus Lens> from the menu

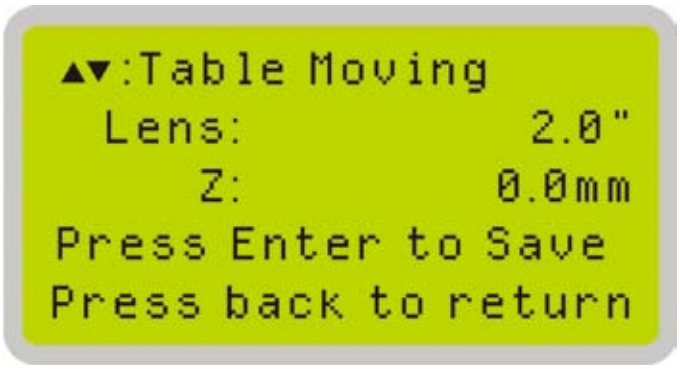
Select Focus Lens Page

The Select Focus Lens Page allows you to modify the lens setting after you have changed to a different focal lens. Remember to save your settings after you have made the proper changes. Now by pressing the Auto Focus button, the LaserPro C180 will auto focus properly using the new lens. The LaserPro C180's default setting is <2.0">

- Lens: 1.5" / 2.0"

Select Focus Lens Page	
Relevant Buttons	**Function**
△ / ▽ Directional	No Action
◁ / ▷ Directional	Scrolls through options
Enter	Saves the indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Tune Auto Focus Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

↓ Select <Machine Setting> from the menu

Machine Setting Page

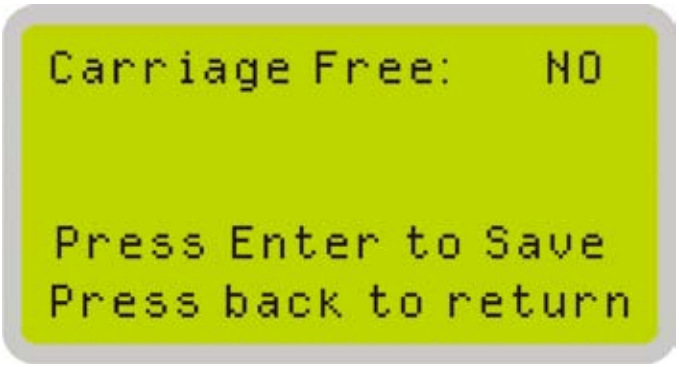
↓ Select <Turn Auto Focus> from the menu

Tune Auto Focus Page

The Tune Auto Focus Page allows you to manually adjust the default auto focus distance / vertical height of the worktable (Z-axis) for when the Auto Focus button is pushed.

Tune Auto Focus Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Move table up and down
◁ / ▷ Directional	No action
Enter	Saves the current focal distance
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Carriage Free Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

↓ Select <Machine Setting> from the menu

Machine Setting Page

↓ Select <Carriage Free> from the menu

Carriage Free 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 controlled via the control panel.

- Carriage Free YES / NO

Carriage Free Page	
Relevant Buttons	**Function**
△ / ▽ Directional	No action
◁ / ▷ Directional	Scroll between Yes/No
Enter	Saves the current setting
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

SmartGUARD Page

Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

↓ Select < Machine Setting > from the menu

Machine Setting Page

↓ Select < SmartGUARD Setting > from the menu

SmartGUARD Setting Page

After installation of the SmartGuard sensor, please enter the SmartGUARD Setting menu on the control panel to enable the SmartGUARD fire alarm.

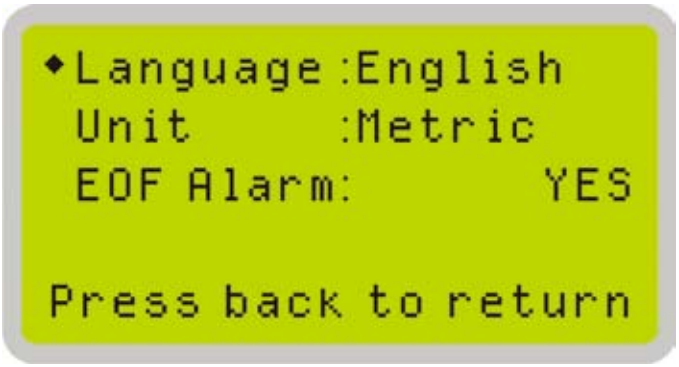
- SmartGUARD : Enable/Disable
- Sensitivity : 1,3,5,7,9 seconds

SmartGUARD :
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 is defined by the delay time from when a fire is detected until the fire alarm alerts user of fire and automatically shuts down the system. For example, if the sensor delays switch is set to the 3 seconds position, the SmartGUARD will start an alarm and automatically shutdown the laser system after detecting a fire for 3 seconds.

SmartGUARD Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll between selections
◁ / ▷ Directional	Scroll between selections
Enter	Save settings
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Others Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

↓ Select <Machine Setting> from the menu

Machine Setting Page

↓ Select <Others> from the menu

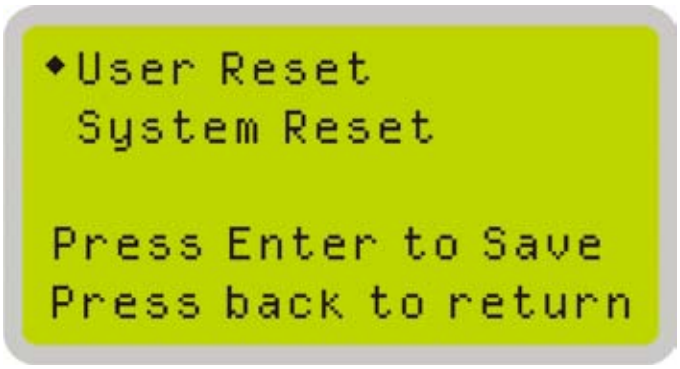
Others Page

The Others Page allows you to change various settings relating to the control panel. The Language setting will allow changing 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 completed.

- Language: ENGLISH (others dependent on Firmware)
- Unit: METRIC / ENGLISH
- EOF Alarm: YES / NO

Others Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll between selections
◁ / ▷ Directional	Scroll between selections
Enter	Save settings
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Reset Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

↓ Select < Machine Setting > from the menu

Machine Setting Page

↓ Select <Reset> from the menu

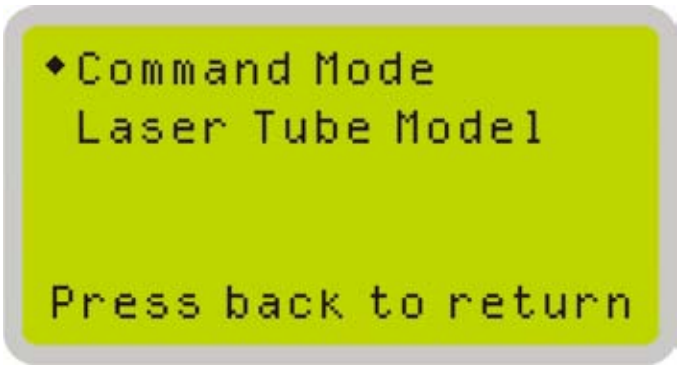
Reset Page

The Reset Page allows you to reset all changes made to the LaserPro C180's Machine Settings Page to their default settings. This does not affect the settings saved to an image file on the computer. The User Reset setting will set all settings back to the default. After any firmware updates, you must use the System Reset setting (your previous settings are saved).

- User Reset (a confirmation will pop up, press Enter to confirm and continue)
- System Reset (a confirmation will pop up, press Enter to confirm and continue)

Reset Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll between selections
◁ / ▷ Directional	Scroll between selections
Enter	Select indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Advanced Setting Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

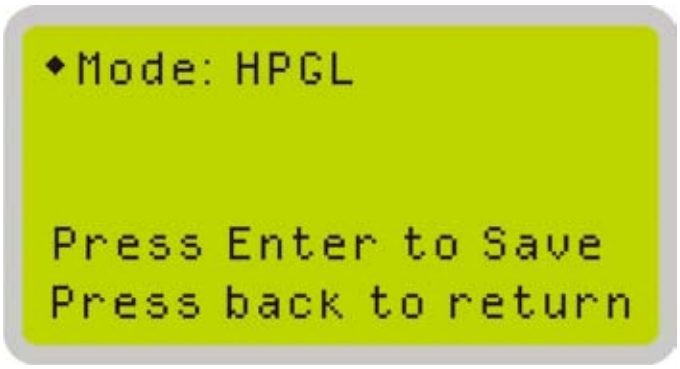
↓ Select < Advanced Setting > from the menu

Advanced Setting Page

The Advanced Setting Page allows you to modify two machine settings namely: Command Mode and Laser Tube Model. Usually we do not need to change these settings.

Advanced Settings Page	
Relevant Buttons	**Function**
△ / ▽ Directional	Scroll between selections
◁ / ▷ Directional	No Action
Enter	Select indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Command Mode Page



Navigating to this page:

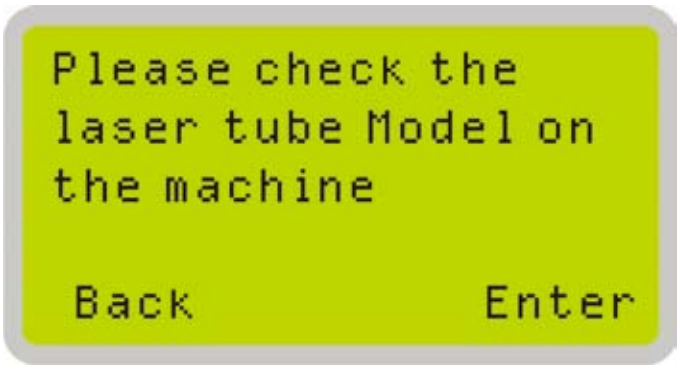
Main Work Page
↓ Press Menu
Menu Page
↓ Select < Advanced Setting > from the menu
Advanced Setting Page
↓ Select < Command Mode > from the menu
Command Mode Page

The Command Mode Page allows you to switch between the Default setting and HPGL mode.

- Default
- HPGL

Command Mode Page	
Relevant Buttons	**Function**
△ / ▽ Directional	No action
◁ / ▷ Directional	Scroll between selections
Enter	Select indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Laser Tube Model Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

↓ Select < Advanced Setting > from the menu

Advanced Setting Page

↓ Select < Laser Tube Model > from the menu

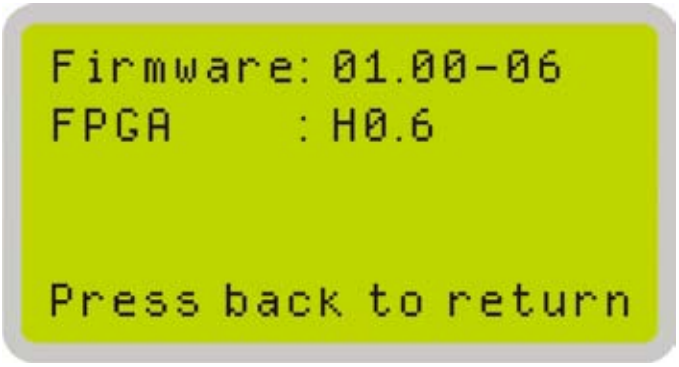
Laser Tube Model Page

The Laser Tube Model Page allows you to correctly indicate the laser installed on the machine in case of laser upgrades or if required after a machine reset.

- C_12/C_30V/C_40

Laser Tube Model Page	
Relevant Buttons	**Function**
△ / ▽ Directional	No action
◁ / ▷ Directional	Scroll between selections
Enter	Select indicated option
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

Machine Information Page



Navigating to this page:

Main Work Page

↓ Press Menu

Menu Page

↓ Select < Machine Information > from the menu

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**
△ / ▽ Directional	Show more info
◁ / ▷ Directional	No action
Enter	No action
Menu	Go to Menu Page
A/F	Initiate the auto focus function
A/F ▲ / ▼ Directional	Manually adjust the height of the work table (Z-axis)
Start / Pause	Go to Main Work page
Stop	Go to Main Work page
Back	Go to previous screen
Light	Turn Light On/Off

5.2 The LaserPro C180 Print Driver

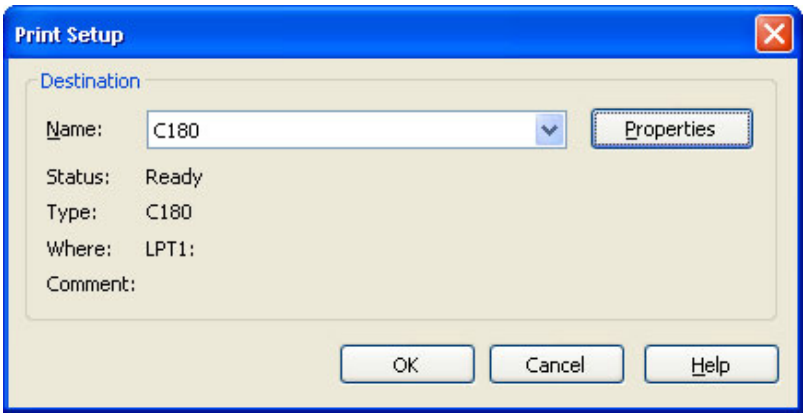
With the LaserPro C180 print driver successfully installed, you will need to adjust the printer and page size default settings before you can begin editing and completing jobs. By doing so, you will be setting the work area in your graphics software to match the LaserPro C180's worktable area.

> **NOTE**
> Please make sure the LaserPro C180 is set to the default printer before proceeding to the page and layout setup.

Ensure that the LaserPro C180 has been selected as the DEFAULT PRINTER. You can do so by going into your Windows Control Panel → Printers and Faxes.

If LaserPro C180 is not selected as DEFAULT PRINTER, you may set it up through the graphics software as well. The following is taking Corel Draw as example of how to set up LaserPro C180 as the Printer.

1) From the primary menu, click FILE → PRINT SETUP.
2) From the navigation bar Name, click C180 → OK



5.2.1 Page Setup and Orientation

The first thing you must do before working with the LaserPro C180 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 C180'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 458 mm (18 inches) and vertical height to 309 mm (12 inches).

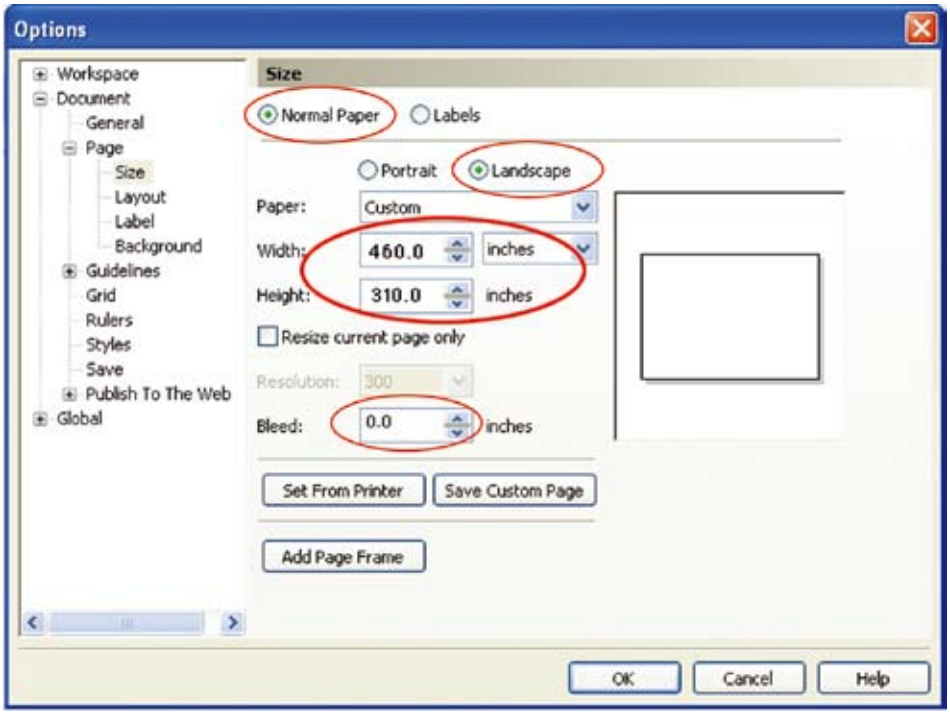
CorelDRAW Example (Page Setup and Orientation)

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.

3) From the primary menu, click LAYOUT → PAGE SETUP.
4) From the navigation bar on the left, click DOCUMENT → PAGE → SIZE.
5) Ensure that NORMAL PAPER and LANDSCAPE are selected.
6) Ensure the Paper Width and Height dimensions match the LaserPro C180's work table dimensions of 458 mm (18 inches) and 309 mm (12 inches).
7) 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 C180's work table. (You MUST have the LaserPro C180 set as the default printer prior to doing this.)



5.2.2 Color Management

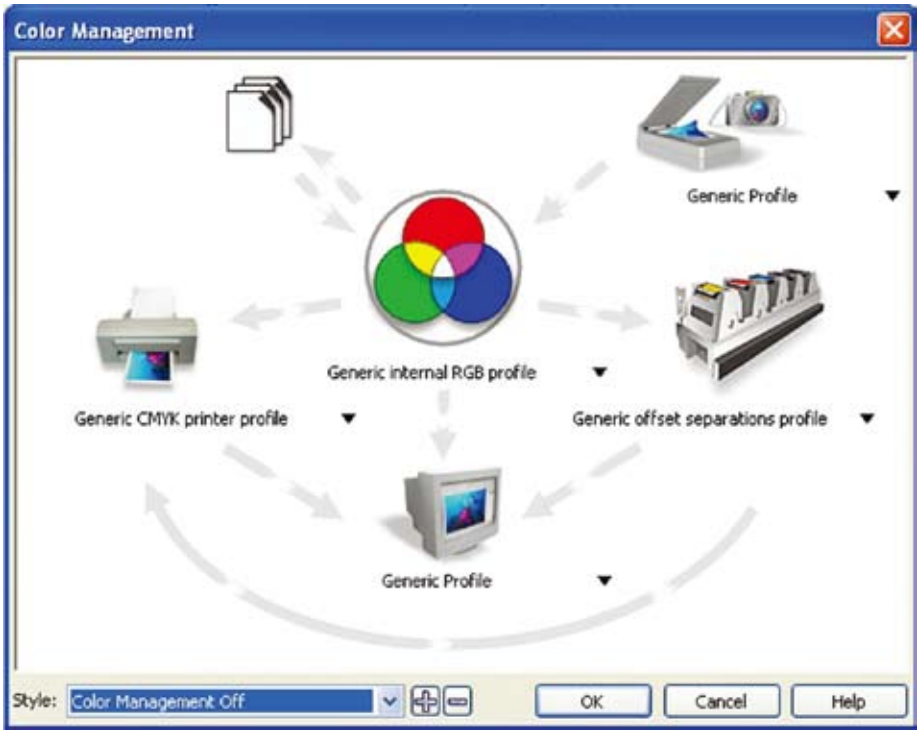
LaserPro driver uses pen color settings to control laser engraver engraving and cutting parameters. In addition to having your Page Setup and Orientation properly set in your graphics software, you will also need to make sure Color Management is DISABLED prior to working with the LaserPro C180 Print Driver.

From your graphic software's Color Management page:
Disable Color Management or set Color Management to Off.

CorelDRAW Example (Color Management)

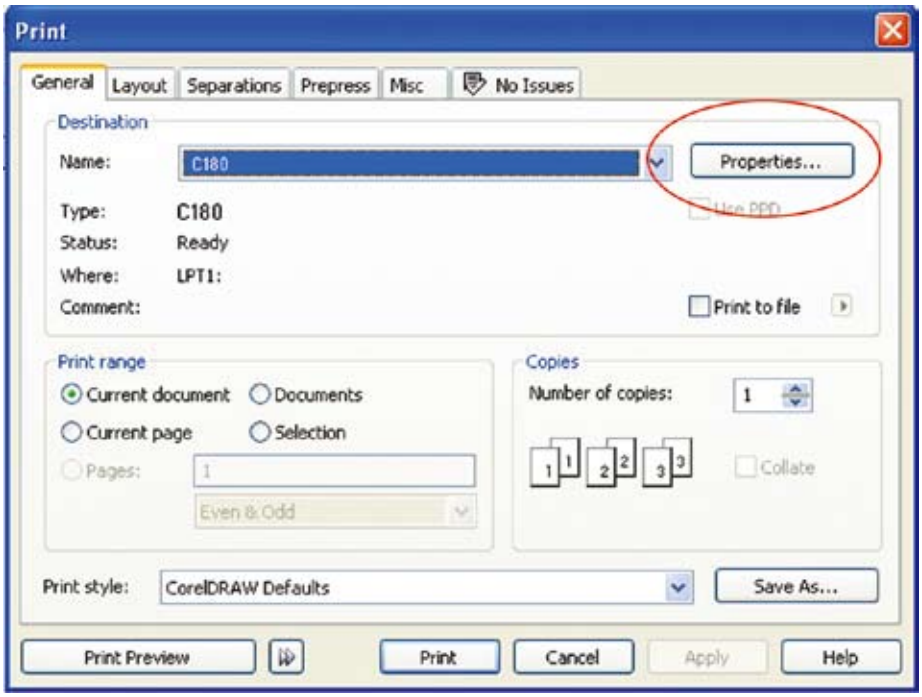
The following is an example of how to properly disable Color Management in the graphics software. CorelDRAW is the designated graphics software used for this example. For other graphics software, you will need to access the corresponding Color Management page.

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 C180 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 C180 Print Driver. The LaserPro C180 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 C180 print driver by going to FILE → PRINT → PROPERTIES.



NOTE

For this screenshot example, CorelDRAW was used as the software application.

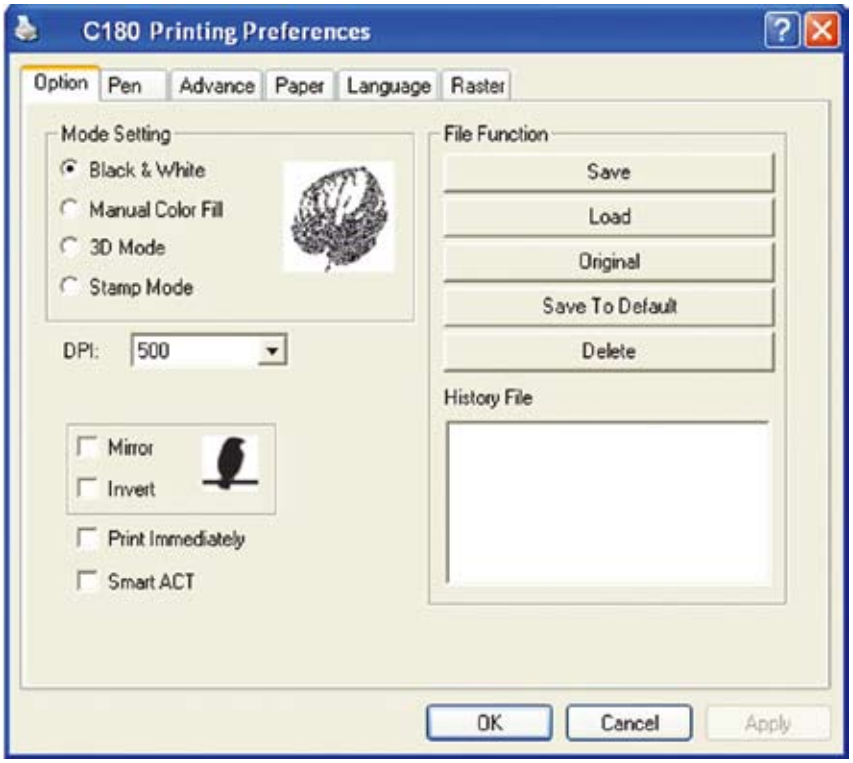
The LaserPro C180 Print Driver consists of seven primary sections (pages) in which you will be able to choose various engraving / cutting options and settings:

- Option Page
- Pen Page
- Advance Page
- Paper Page
- Language Page
- Raster Page (appears only in Black & White Mode)
- Stamp Page (appears only in Stamp Mode)

Tip

The following sections describe the specific functions for each of the settings found in the LaserPro C180 Print Driver. If you are new to laser engraving, it is recommended that you first familiar yourself with the general principals of the laser process in Chapter 6, especially the Vector Cutting and Raster Engraving concepts. This will make it easier to understand the various descriptions and terminology used in this section.

5.2.3.1 LaserPro C180 Print Driver >> Option Page



Mode Setting (OPTION PAGE) [DEFAULT SETTING: Black & White]

You can select four primary mode settings, depending on your application or results you would like to achieve.

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 entire selected image will be engraved using a single set of power & speed settings (the black pen from the PEN menu. Please refer to the next section of the manual for details regarding the PEN functions). The LaserPro C180 print driver will interpret colored and shaded areas as different shades of gray by producing a halftone effect while engraving. Instead of engraving only solid lines, gray/ halftone areas will be a collection of dots with varying density.

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 C180 Print Driver, allowing you to adjust advanced stamp-related settings.

Manual Color Fill: Select this mode when you would like to designate specific power and speed settings and link them to certain colors of your image. The LaserPro C180 print driver allows a maximum of 16 pen parameters to be set.

3D Mode: Select this mode to attain a sculptured 3D effect on your engraving. By using images that have a range of gray areas, the LaserPro C180 print driver can manipulate the image to give it added depth, by linking the laser power (depth of engraving) to specific colors. The settings can be adjusted through the DPI setting (Option page) and PPI, power and speed settings (Pen page).

Stamp Mode: Select this mode to when you would like to engrave stamps. The stamp mode is one of the more dynamic functions of the LaserPro C180. Due to the unique engraving nature when engraving a stamp, the stamp production requires different operational steps than most engraving or cutting operations.

NOTE

Selecting the Stamp mode will enable the Stamp page on the LaserPro C180 Print Driver, allowing you to adjust advanced stamp-related settings.

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 a more time to complete. Lower DPI settings result in coarser and shallower engravings, but require less time to complete. The LaserPro C180 offers 8 DPI options: 125, 250, 300, 380, 500, 600, 760, 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).

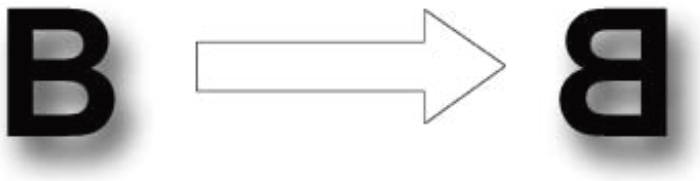
Set DPI	125	250	300*	380	500	600*	760	1000
Actual DPI	127	254	381	381	508	762	762	1016

Mirror (Option 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.

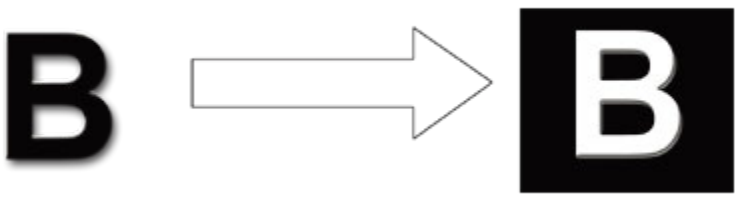
Tip

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 (Option 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 in disabled with Manual Color File mode selected.



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

Checking this will instruct the LaserPro C180 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 C180 system and will need to be initialized from the LaserPro C180 control panel.

File Function (Option Page):

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

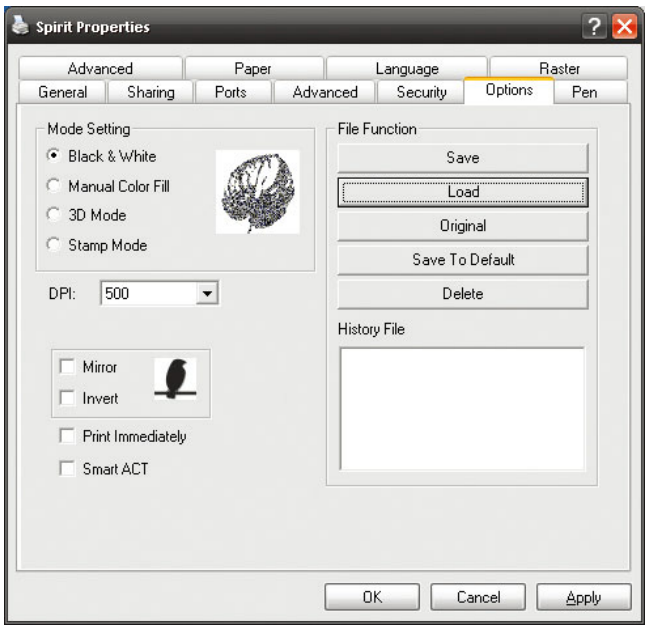
- **History File:** This section contains a list of the recent files you have recently created and worked with.
- **SAVE:** This function will save current print driver parameter settings to a file under the specified location on your computer. (Saved parameter setting files will be tagged with the ".C18" extension)
- **LOAD:** This function allows you load previously saved print driver parameters or LaserPro parameter database.
- **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 startup 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 .H2O file from your hard drive, if you wish to completely remove the file from your hard disk, and you will have to manually delete the file from your operating system.)

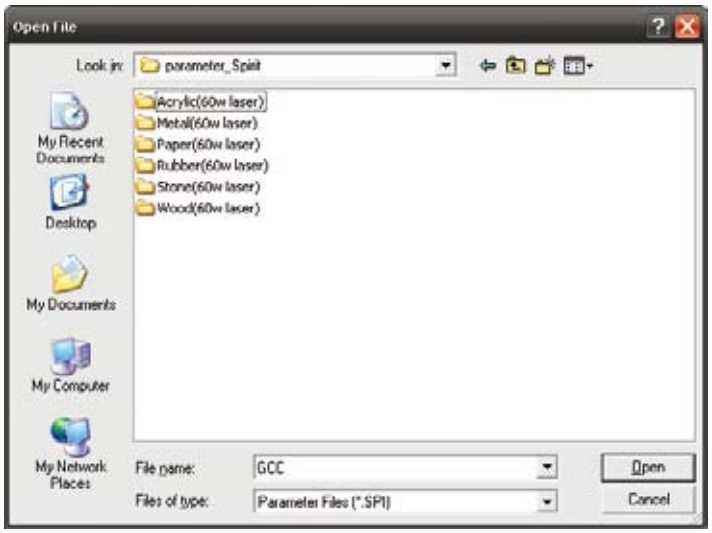
NOTE

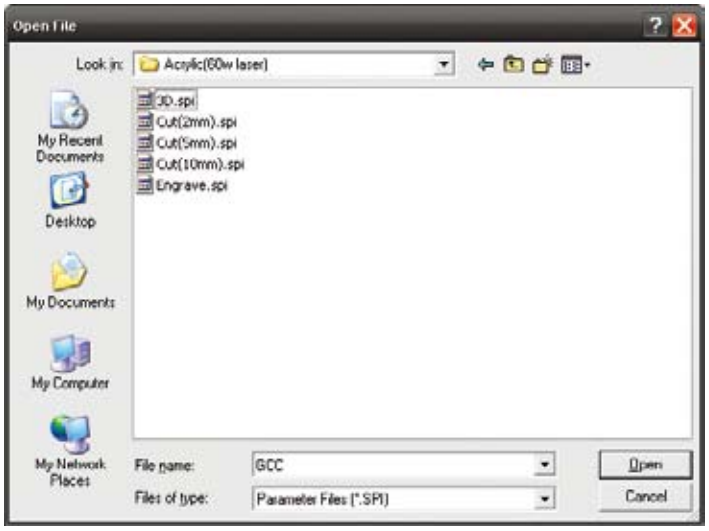
If you are using Windows 2000 or XP as your operating system, then make sure you log in with an administrator or administrator-rights account in order to properly save laser parameter settings.

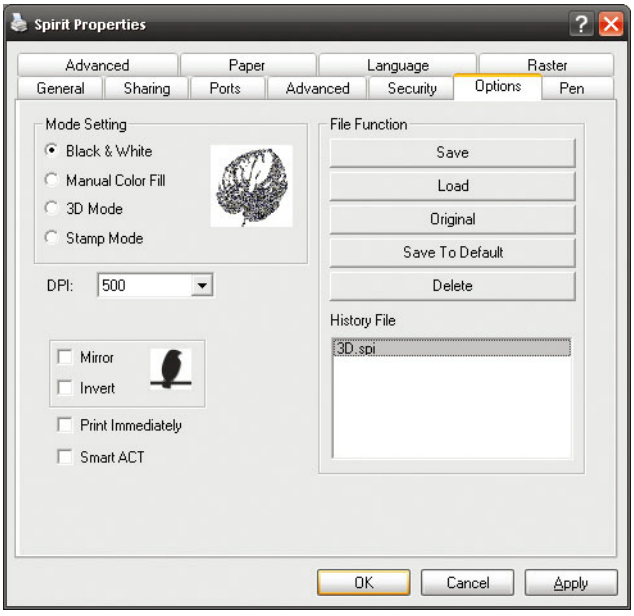
Tip

LaserPro material database settings allow you easy to load the several parameters. If you are loading LaserPro parameter database as your operating parameter, please direct load from several build-in parameter folders.



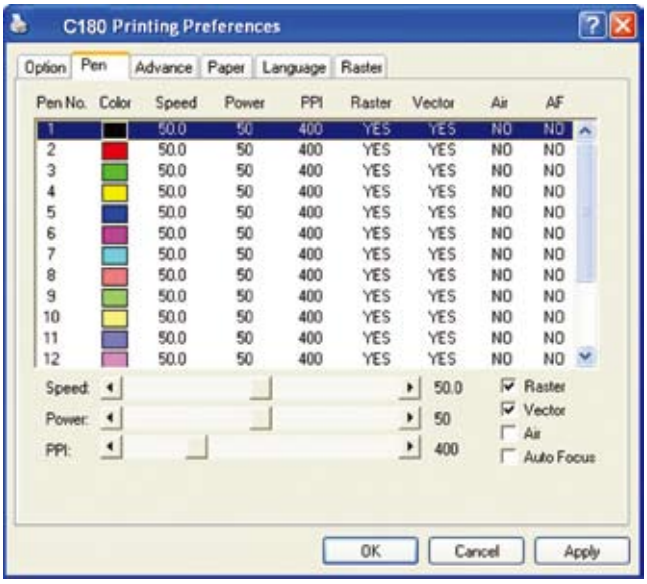




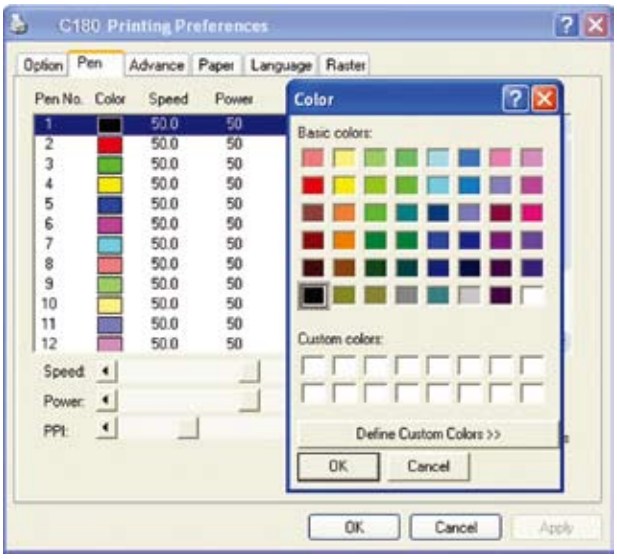


5.2.3.2 C180 Print Driver >> Pen Page

The LaserPro C180 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 C180 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 would like to assign the laser settings based on the existing colors based on your current image.



NOTE

The LaserPro C180 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 a range setting from 0.1 – 100%. The LaserPro C180's maximum laser processing speed is 40 inches per second, therefore a setting of 100% speed is equivalent to 40 inches per second and a 10% speed setting would be equivalent to 4 inches per second. Keep in mind, this is the speed the laser moves at when cutting or engraving straight lines. The machine will automatically slow down when processing curves.

Tip

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

Power (Pen Page) [DEFAULT SETTING: 50]

The power slider controls the laser's power during operation (engraving power) with a range setting from 1 – 100%. The percentage setting represents the power for each laser pulse fired.

Tip

Cutting / engraving depth and quality are determined by a combination of power and speed. Slower speeds 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 number of times the laser pulses (fires) per linear inch, exclusive for vector cutting. Higher PPI settings will generate deeper, overlapping laser pulses, resulting in cleaner cuts. Lower PPI settings (lower than 150) will result in the individual laser pulses being spread apart, resulting in a perforated effect (similar to the perforation in the paper between mailing stamps).

If you drag the PPI slider to the furthest right (maximum), the value will change to X. This completely disables the PPI control and continuously fires the laser non-stop, without pulsing. Think of setting PPI to X as being equivalent to turning a water facet on with the water continuously flowing out. This also 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).

Tip

For Vector Engraving jobs, we recommend a PPI setting > 150
For Vector Cutting jobs, we recommend a PPI setting of > 400

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.

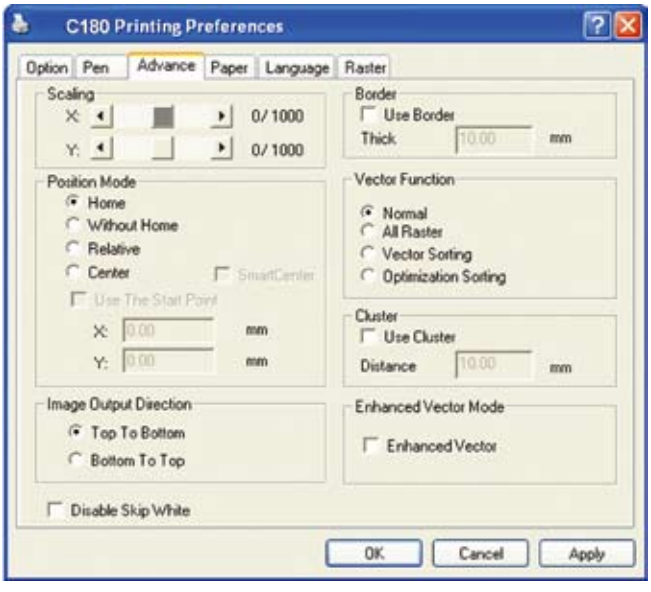
As an example: a particular "pen" color may be assigned to areas in your design containing color fills (raster engraving) and very thin lines (vector cutting). By checking / unchecking the Raster and Vector will force the driver to process / ignore the color fills / thin lines.

	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

Auto Focus (Pen Page) [DEFAULT SETTING: Unselected]

This checkbox sets the Auto Focus for that particular job. With the Auto Focus button checked, the LaserPro C180 will automatically initialize the auto focus procedure before starting the job. This will ensure the focal distance is properly set based on the particular material you are working with and the focal lens you have installed.

5.2.3.3 C180 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 that there may be a 1-unit offset for every 300 unit increments. As an example, if you engrave a 300 mm straight line, it may end up measuring only 299 mm or 301 mm 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 laser head after each job completion and before the next subsequent job.

- **Home**: Resets the positioning of the laser head to the "home position" (upper-right) before and after each job.
- **Without Home**: The laser head will start the next job based on its position from its graphic application software setting, from the last position of the previous job. Upon completion of the current job, the laser head will remain at the last position of the previous job.
- **Relative**: This mode sets the current laser head position to correspond to the origin (top left) position of the graphic software. Therefore, the laser head will process the job from its current position relative to its setting in the graphics software.
- **Center**: Sets the current position of the laser head 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 C180 will vector cut a circle around the initial position of the laser head.

Tip

It is highly recommended you enable the red dot laser pointer when setting / adjusting the Position Modes, as this makes accurate positioning of your laser carriage for your particular jobs much easier.

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**: 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 C180 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 air 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 air 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 Sorting:** When performing a vector cutting job in which your image has one vector cut area enclosing within another vector cut area, select the vector sorting mode. This mode will automatically instruct the print driver to process the inside vector image and moving outwards. If you try to process a vector image that has multiple layers without using this mode, what may occur is the laser engraver may process the outer vector cutting first, and any inner vector cutting will not be possible as your centerpiece material may have dropped to the cutting table. This setting will always automatically direct the laser to cut from the inner most vector shape and move outwards.
- **Optimization Sorting:** 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.

Use Cluster (Advance Page) [DEFAULT SETTING: Unselected]

This setting allows you to change how the LaserPro C180 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 somewhat side-by-side with empty space 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 laser head 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.

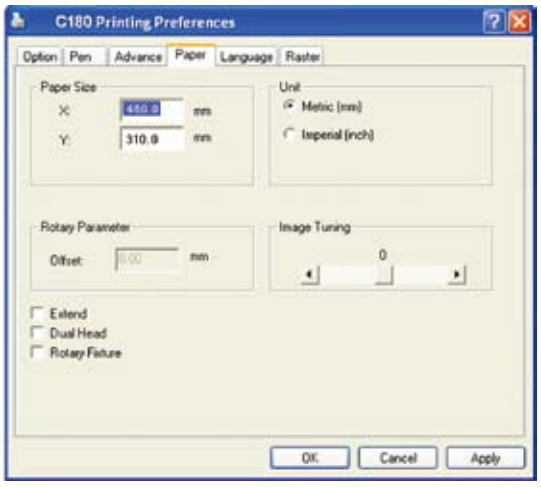
Enhanced Vector Mode (Advance Page) [DEFAULT SETTING: Unselected]

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

True Image Mode (Advance Page) [DEFAULT SETTING: Unselected]

This setting allows you to improve the engraving quality by reordering the line by line output sequence and by doing so masking the banding problems. This feature is only suitable for engraving large sized graphics. Note: The overall working time will be increased.

5.2.3.4 C180 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 C180's worktable area of 18" x 12" (458 mm x 309 mm). The X value represents the length and the Y value represents the width.

> **NOTE**
> When using the optional rotary attachment system and with the Rotary Fixture option checked, the X value represents the length of your working piece. The Y value will be changed to Diameter, which represents the diameter of your working piece (at the position you wish to engrave).

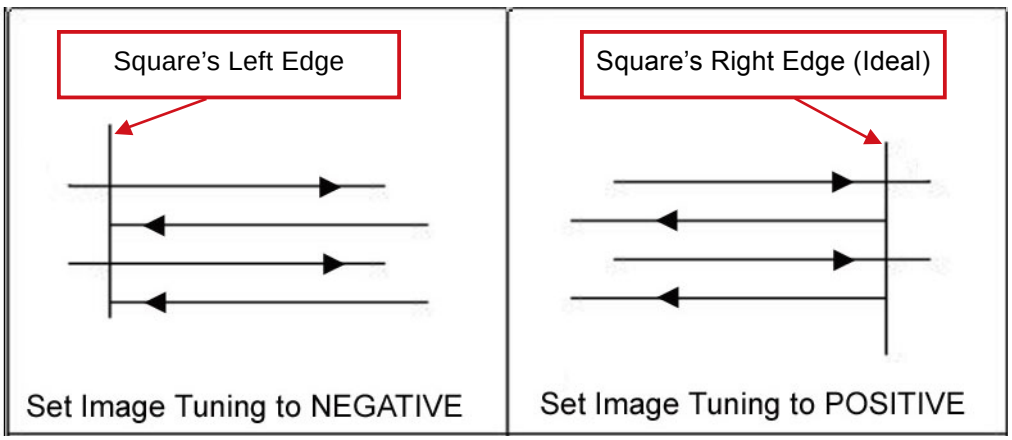
Unit (Paper Page) [DEFAULT SETTING: Metric (mm)]

Here you can set your preferred measurement standard in which you would like use with the C180 print driver. You can choose between metric or imperial standards.

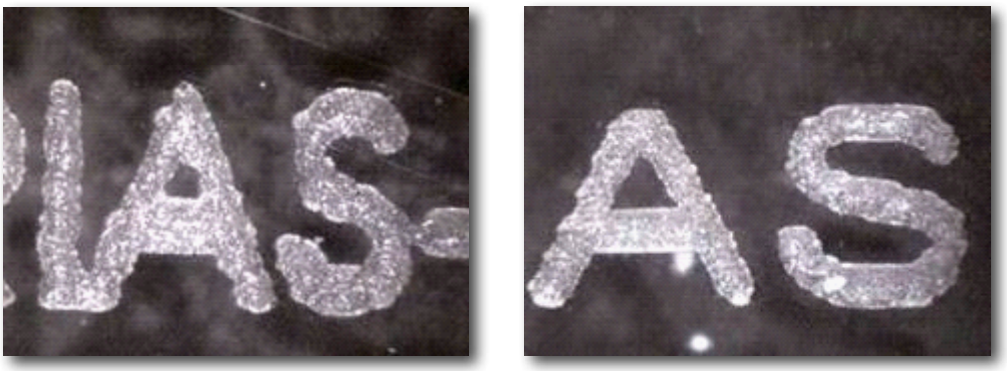
Image Tuning (Paper Page) [DEFAULT SETTING: 0]

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 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 laser head 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 of how having the proper image tuning is important 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).



Rotary Fixture (Paper Page) [DEFAULT SETTING: Unselected]

> **NOTE**
> This option is only to be used with the Rotary Attachment optional accessory properly set up. For instructions on how to set up the Rotary Attachment, please refer to Chapter VII of this manual.

You will need to select the option when processing a job with the optional rotary attachment system to engrave on rounded or cylindrical objects. When you have your material and rotary attachment properly set up:

1) Check the Rotary Fixture function and notice the change in the Paper Size fields. Under Paper Size, the X value represents the length of your work piece. Enter the length of your work piece in this field.
2) Under Paper Size, the Diameter value represents the diameter of your working piece (at the position you wish to engrave). Enter the diameter of your work piece in this field. Again, remember the proper diameter value would be the diameter location, at the point of engraving on your work piece.
3) Under Rotary Parameter, the Offset value represents distance from the open end of your work piece to the base of the padded rubber wheel. This value will be displayed on the C180's LCD panel. Enter the proper offset value in this field.

Uninstall Driver (Paper Page)

Select this to uninstall the C180 print driver. You will then need to restart your computer to complete the process.

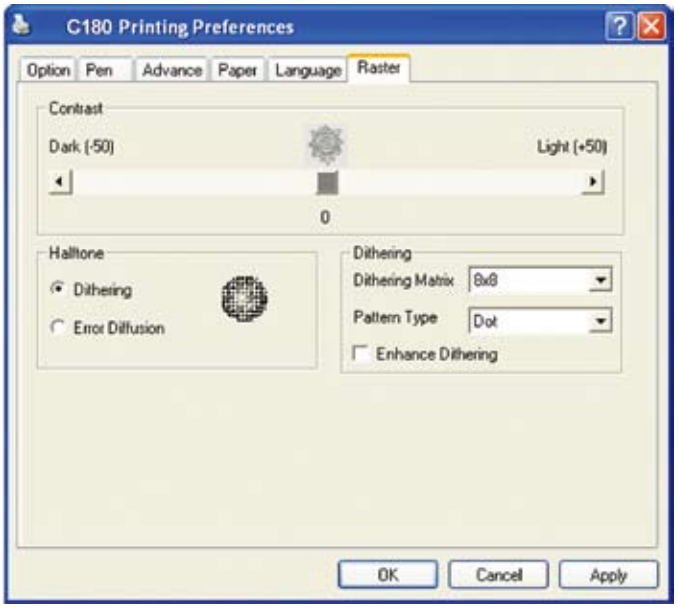
5.2.3.5 C180 Print Driver >> Language Page

This page allows you to specify the language displayed by the C180 Print Driver. Available language options include: English, Spanish, French, Japanese, German, Simplified Chinese, and Traditional Chinese.

5.2.3.6 C180 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]

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.

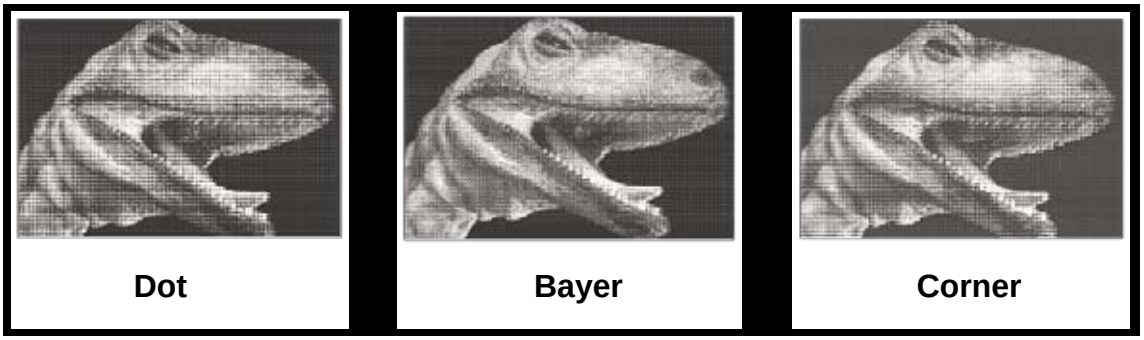
Tip

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

Halftone (Raster Page) [DEFAULT SETTING: Dithering]

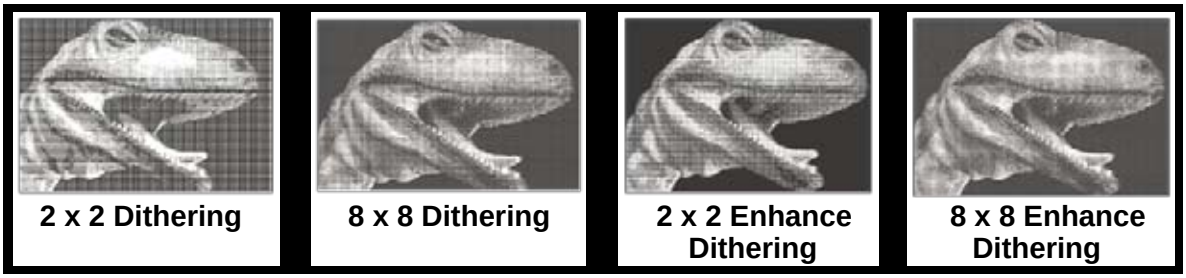
This option controls the way a raster-engraved image is processed. The "digital image to engraved output" process can be processed via two methods: Dithering or Error Diffusion. Each offer additional output options yielding different output effects, style, and quality.

- **Dithering:** 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** [DEFAULT SETTING: Dot]
    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: 8 x 8]

    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.



- **Enhance Dithering [DEFAULT SETTING: Unselected]**

  Selecting this will produce a finer dithering output.

- Error Diffusion (Raster Page): 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.

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, 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 C180 Print Driver >> Stamp Page

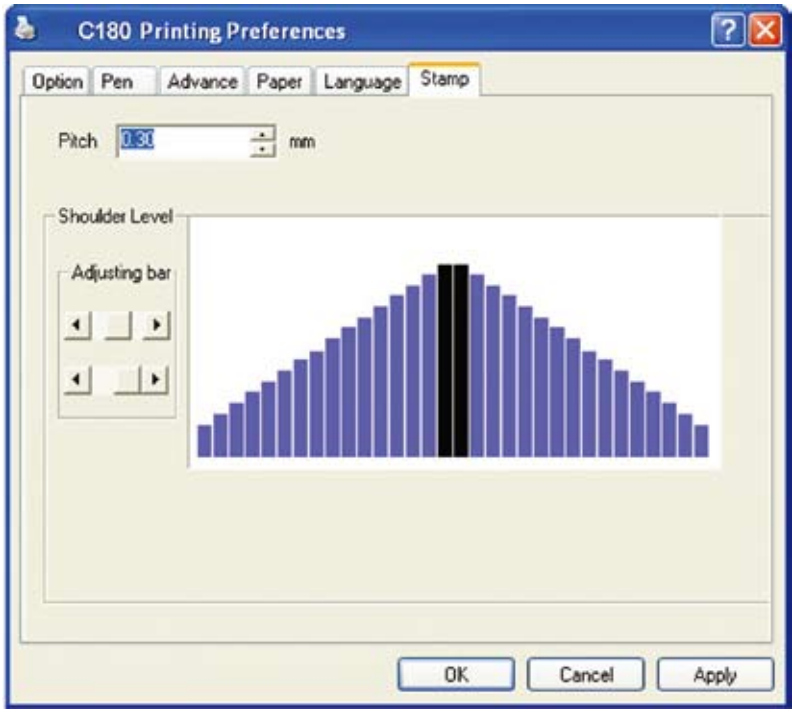
Producing stamps require different operational steps than your standard engraving or cutting jobs. The Stamp page offers dynamic options allowing you to customize your stamp production process.

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 C180 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.

6

Chapter 6

Engraving and Cutting Techniques

Raster Engraving

Vector Cutting

Vector and Raster

3D Tips

Modify Image Setting of a Picture for Better Engraving Quality

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 laser head 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 C180 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" (0.025 mm) to 0.004" (0.1 mm) 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.

1) With the text function, create a string of characters and select those characters by clicking on the text.
2) 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).
3) Change the outline color of the selected characters outline by right clicking on the desired color from the CorelDraw Color Palette.
4) 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.
5) 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 C180) 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:

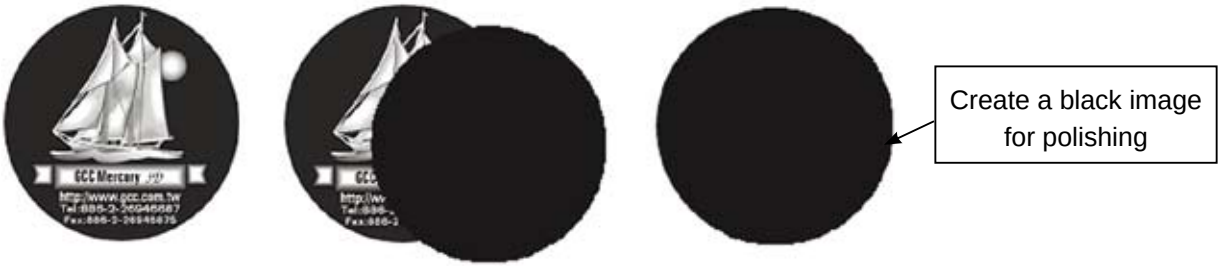
In these situations when there are raster engraving and vector cutting operations on a single project, the LaserPro C180 driver will interpret between raster sections and vector sections by the types of lines and line widths of your design. Areas of your design with line widths set between 0.001" (0.025 mm), 0.004" (0.1 mm) will be designate for vector cutting, and the other areas will be designated for raster engraving.

6.4 3D Tips

When doing 3D sample on LaserPro C180 (C180-30), acrylic or MDF wood are ideal materials for the purpose. For acrylic the suggested PWR is 100%, SPD around 30% (depends on how deep you want to cut).

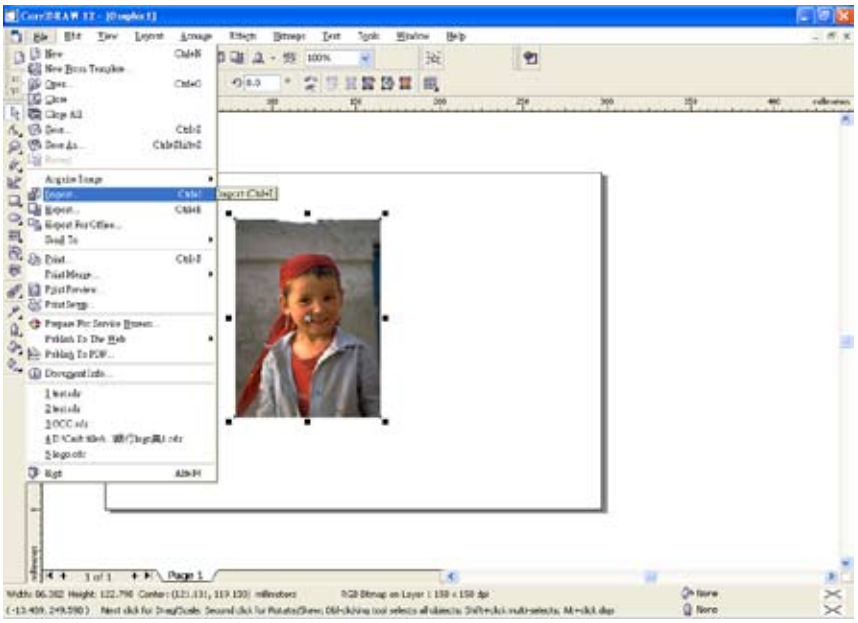
The perfect image for 3D is like those shown below. When image is ready, choose 3D Effect as the output mode in the driver. Sometimes, some material shows better effect if you run the job with 2nd pass with laser out-of-focus. Especially with acrylic, the 2nd pass will smooth out the surface.

For engraving wood, as it burns easily and leaves blackened surface after the 1st pass, it is necessary to run the 2nd pass to remove the burned surface. To do that, simply fill the image with black color as the mask (see below) and Run the black mask image with PWR 100% and SPD100%.

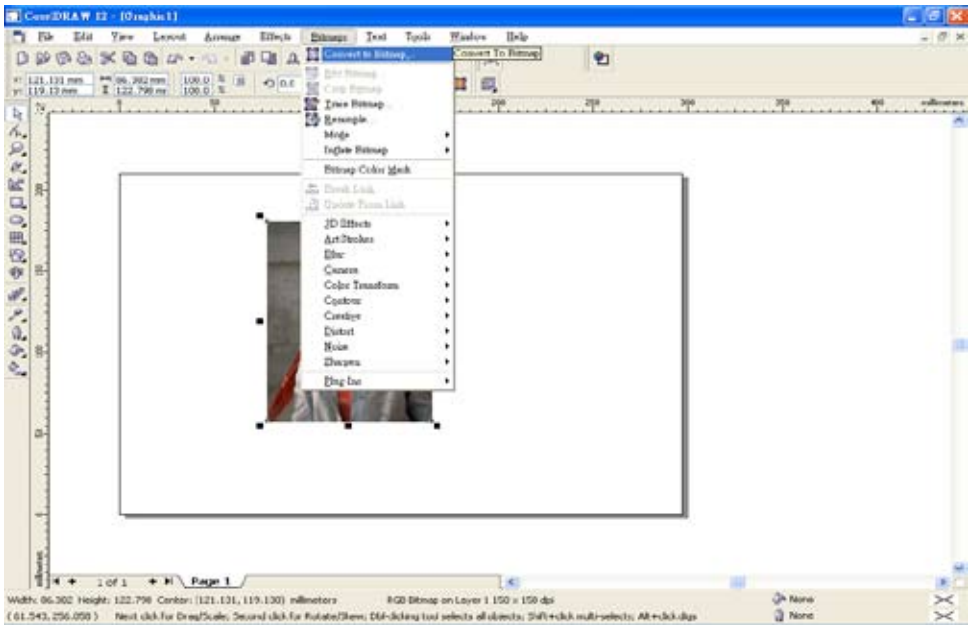


6.5 To modified image settings of a picture for better engraving quality

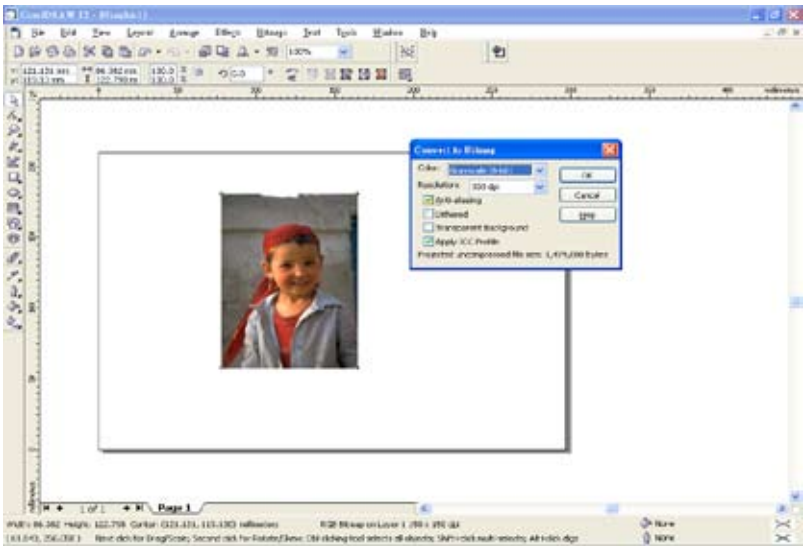
1. Connect your digital camera to the computer by USB cable.
2. Download the picture from the digital camera to the computer
3. Select the picture that you want to engrave.
4. Import the image from the folder where the picture is located by selecting File/Import



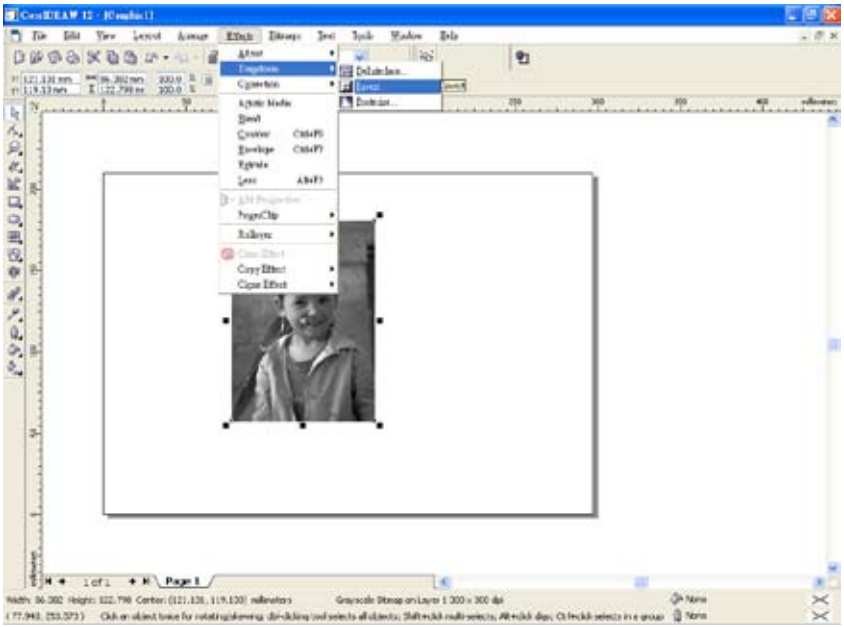
5. Convert the image to Bitmap by selecting the image and click on Bitmaps/Convert to Bitmap.



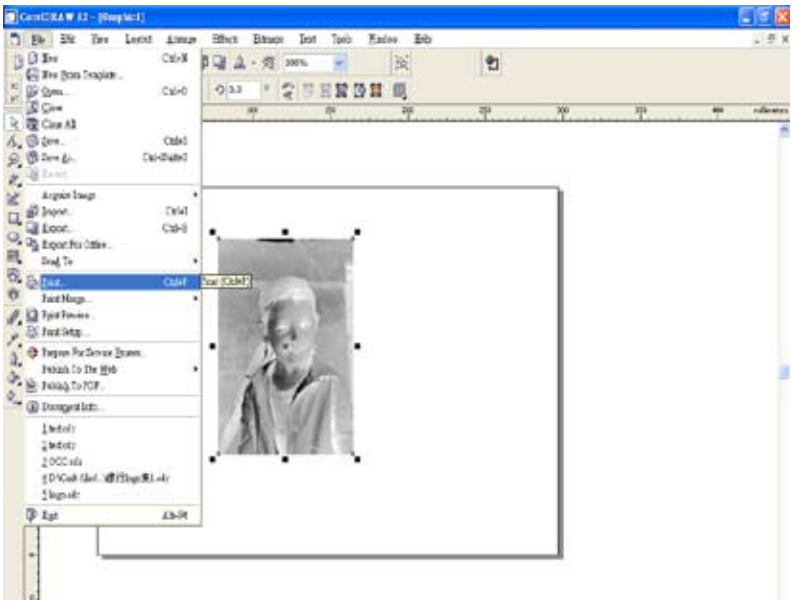
6. Change the Bitmap settings by setting “Color” to Grayscale (8-bit) and “Resolution” to 300 dpi and click OK.



7. Finally, Invert the image by selecting Effects/Transform/Invert



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



NOTE

This instruction is a simple example for general use. There are many tips and tricks to achieve a good engraving quality. It takes a lot of practice and experience to achieve a good engraving quality. Different picture may need different modifications and different material may need different parameters.

7

Chapter 7

Optional Items

When purchasing the LaserPro C180 from your local authorized GCC distributor, you will be provided a chance to purchase optional items to enhance your experience with your system. If anytime after the purchase of your LaserPro C180, would you like to purchase any optional item, please contact your local authorized GCC distributor.

7.1 Air 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 air extraction system. The air 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 compatible models found at your local industrial supply store.

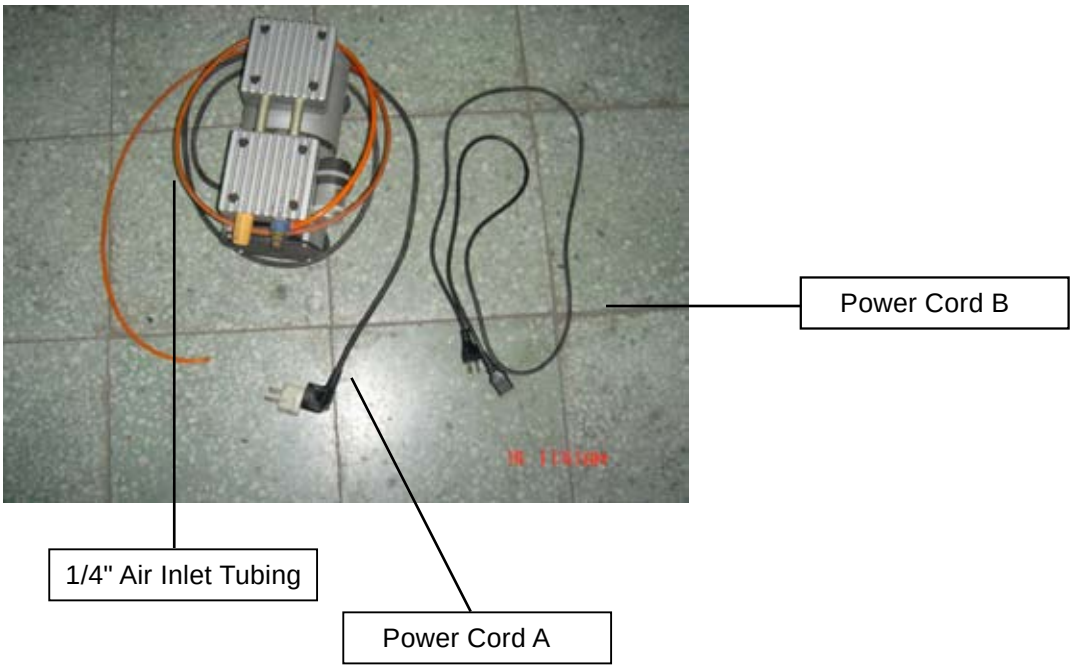
LaserPro's Air Extraction Systems are specifically designed to prevent personnel from inhaling hazardous fumes and dust generated by the laser process. Available for all LaserPro engravers, the LaserPro Air Extraction System represents the latest in fume extraction and odor reduction technology for all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

INSTALLATION (Self-Assembled Unit):

1) Purchase an exhaust system at your local industrial supply store, we recommend you to have a contractor install the exhaust system is a centralized exhaust system is preferred. We highly recommend you to use movable exhaust systems with filter systems.
2) Mount the exhaust system in an obvious and accessible location, not too far from the C180, so it can be routinely switched on prior to laser engraving. The maximal distance you should mount the exhaust system away from the C180 depends on the blower's vacuum capacity. We recommend 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 a 2" diameter to the ventilation opening located on the rear side of the LaserPro C180. (As shown in the picture below). 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.

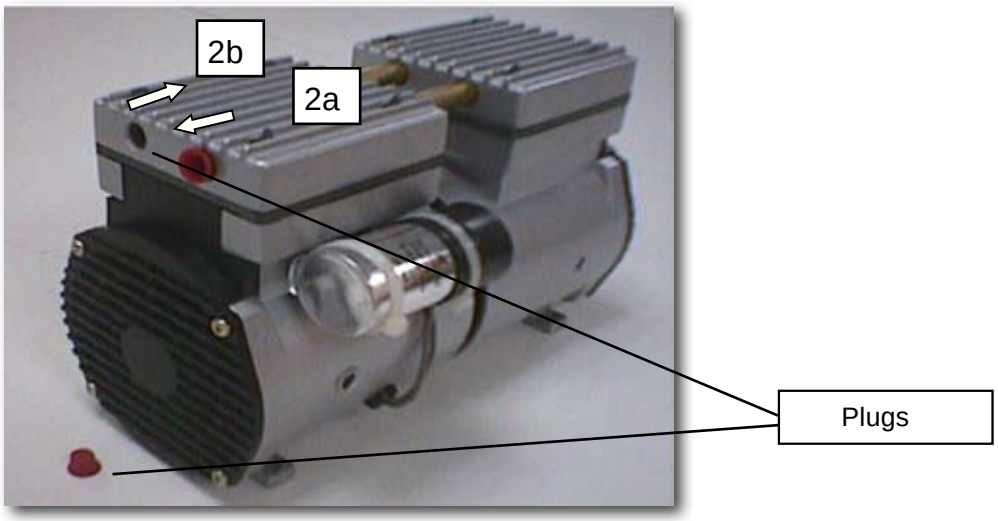
7.2 Air Compressor Option

Specifically designed for laser engravers, the air compressor utilizes an oil-free diaphragm. 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.



INSTALLATION:

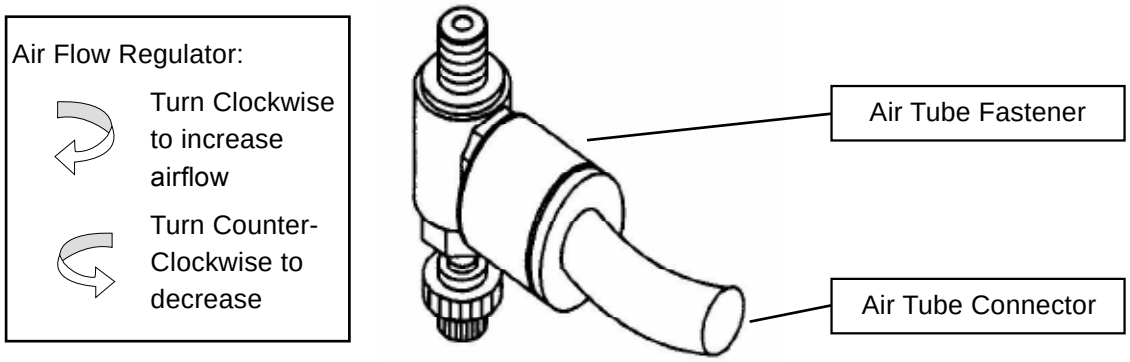
1) Remove the plugs on the air compressor to expose the air inlets.
2) Fasten the included air tube fastener valve to the outgoing air inlet (indicated by 2a) and the air filter into the ingoing air inlet (indicated by 2b).



3) Connect a ¼" tubing to the air tube fastener valve on the air compressor.

> **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) 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.



5) Congratulations, you have finished setting up the air compressor. Make sure you have the proper SmartAIR nozzle installed (depending on your application), before you turn on and utilize the air compressor.

OPERATION:

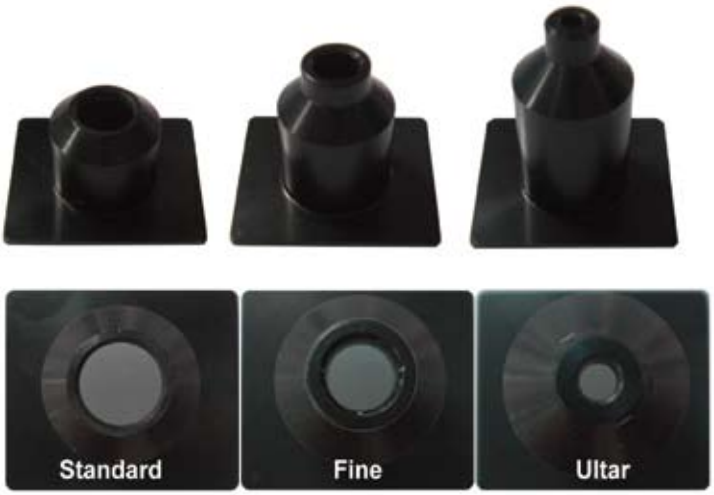
1) Switch on the air compressor unit and make sure that the airflow regulator on the air assist valve is opened (turn clockwise to increase the airflow, counter-clockwise to decrease the airflow). The air nozzle under the laser head should emit a steady flow of air.

7.3 Honeycomb Table Option

Honeycomb tables are important to tune out a beautiful output when working with cutting operations. The C180 has a very easy to install honeycomb table. Simply lay it on top and against the upper left corner of the working area for use.

7.4 SmartAIR Nozzle (Fine/Ultra)

The optional SmartAIR Fine Nozzle is recommended for engraving or cutting thin materials such as textile. The smaller caliber nozzle is positioned closer to the object for a concentrated blast directed over a small area to eliminate burning on the cutting edge. The perfectly-vertical design of the SmartAIR Fine Nozzle produces a concentrated airflow to blow away dust and unwanted residue, leaving a clean product surface. The Ultra Nozzle is recommended for the need of even stronger airflow for applications such as deep cutting.



7.5 SmartGUARD Fire Alarm Option

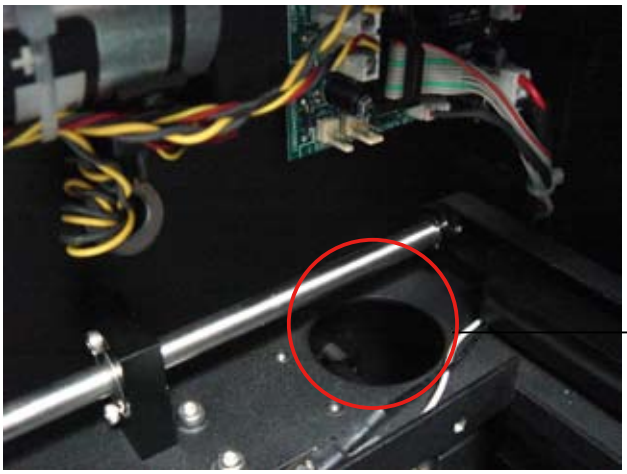
Laser cutting and engraving operations using the SmartGUARD device protects the operator, machine, and the work products from potential fire hazards. During the engraving process, flames may be produced when working with combustible or easily-flammable materials, such as paper or wood. The SmartGUARD is an optional item that can be set to notify the operator through audio warnings and automatically shutdown the machine as a safety precaution.

INSTALLATION:

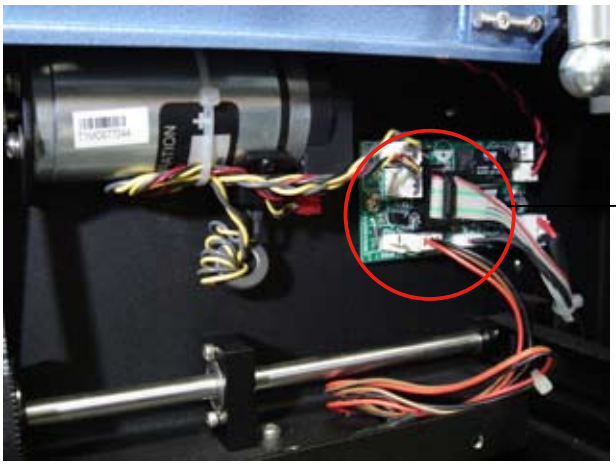
If you have purchased your system with SmartGUARD, then no installation is required, as your system will arrive with SmartGUARD pre-installed. For system owners that did not initially purchase this option, but would now like to add the SmartGUARD, they will need to contact your local authorized GCC distributor to have this great feature installed.

1. Lift top cover of the C180 using the handle.

Remove the rear plate covering the Y motor and rear panel of the working area



Insert the SmartGuard cable through the openi ng



Connect the cable as shown

7.6 SmartMEMORY Module Option

The SmartMEMORY module option increases productivity and efficiency by allowing you to save and load unfinished tasks, without having to retransmit task settings from the computer again. It enables to save and load your working files to and from the C180. In addition, the SmartMEMORY module is portable and can be used to transfer task settings from one machine to another.

INSTALLATION:

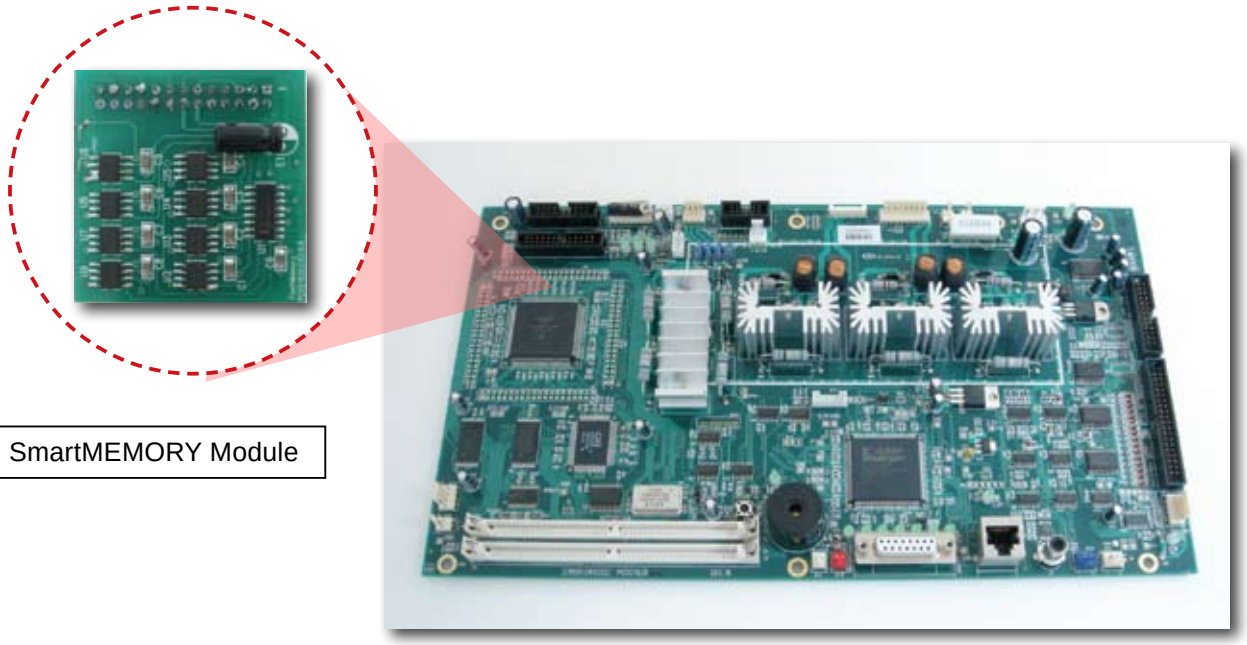
CAUTION

It is highly recommended you completely turn off the C180 and unplug its cord from the power source before installing or removing the SmartMEMORY module.

1) To install the SmartMEMORY module, you will need to first access the system's motherboard. To do so, use a screwdriver to remove the two screws securing the panel on the right hand side of the C180.

2) Remove the panel to access C180's motherboard.

3) Simply connect the SmartMEMORY module to the connector on the C180's motherboard (indicated in the pictures below).



SmartMEMORY Module

LaserPro C180's Motherboard

OPERATION:

With the SmartMEMORY module installed, you will be able to SAVE and LOAD to the SmartMEMORY:

NOTE

In order to properly use the SmartMEMORY module with the C180, ensure the C180's firmware is version 1.02 or later. Also keep in mind, the capacity of the SmartMEMORY module is 4MB, please do not save files that exceed this limit.

SAVE files to the SmartMEMORY module:

1) Navigate to the Write Flash Memory function. From the C180 Control Panel, press the F4 (Function) → MACHINE SETTINGS → FLASH MEMORY → WRITE FLASH MEMORY.

2) By selecting the Write Flash Memory function, the tasks stored on the C180 will be transferred over to the SmartMEMORY module.

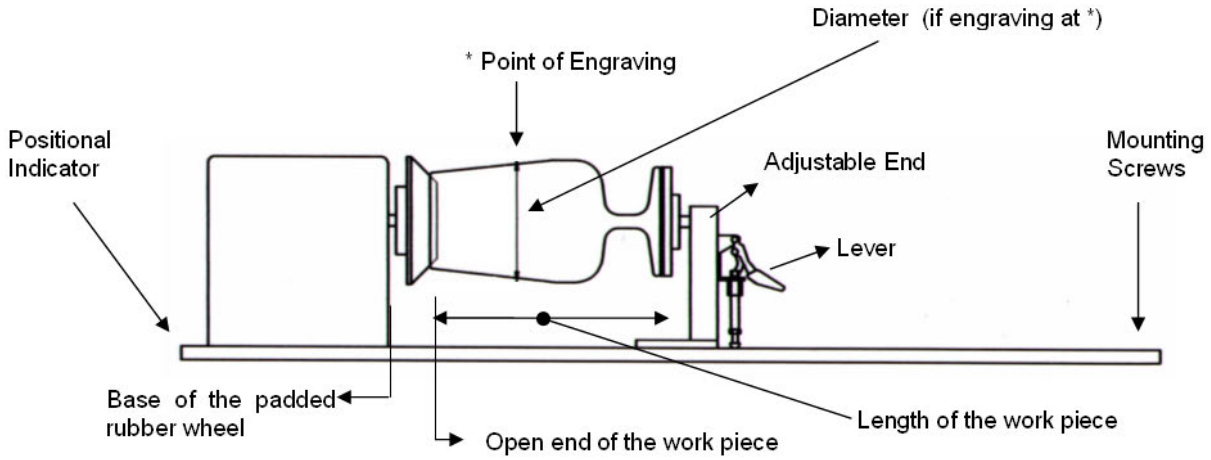
LOAD files from the SmartMEMORY module:

1) Navigate to the Read Flash Memory function. From the C180 Control Panel, press the F4 (Function) → MACHINE SETTINGS → FLASH MEMORY → READ FLASH MEMORY.

2) By selecting the Read Flash Memory function, the tasks stored on the SmartMEMORY module will be transferred over to the C180.

7.7 Rotary Attachment Option

The rotary attachment option provides the LaserPro C180 with the ability to engrave on cylindrical or spherical objects. In addition to the standard X, Y, Z axis, the rotary attachment allows for a fourth axis which rotates your object 360° to allow for engraving on cups, wine glasses, and even spherical objects.



Work Piece Limitations		
Model	**C180**	**C180S**
Maximum Length	250 mm (10.0 inches)	
Maximum Loading Weight	5 kg (11 lbs.)	
Minimum Diameter (Small conical fixture)	12 mm (0.5 inches)	12 mm (0.5 inches)
Maximum Diameter (Small conical fixture)	50 mm (1.9 inches)	50 mm (1.9 inches)
Minimum Diameter (Large conical fixture)	90 mm (3.7 inches)	×
Maximum Diameter (Large conical fixture)	125 mm (5 inches)	×

INSTALLATION:

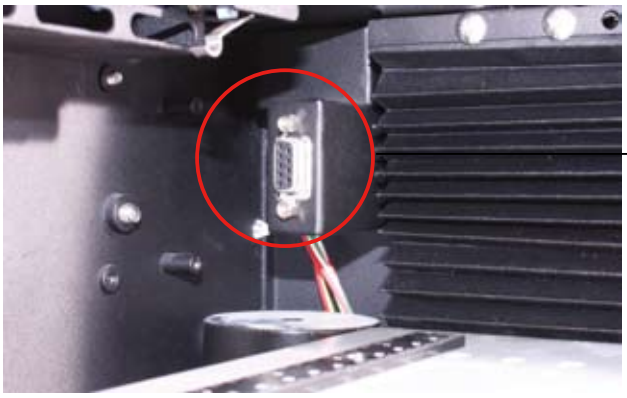
1) Open the front panel of the LaserPro C180, lower the working platform to the bottom.
2) Turn off the power of the laser engraver.
3) There are different system configurations on LaserPro C180 and the rotary attachment is installed accordingly. For machines without the built-in SmartBox, the rotary attachment is positioned on the working table. For machines with built-in SmartBox, the rotary attachment can be placed on the base of the SmartBox and used with the large conical fixtures to engrave objects with larger diameter.
4) When placing the rotary attachment on the working table and working with small conical fixtures, we can only use the small conical fixtures (for working with small objects with diameters 0.5"-1.9").

5) If the built-in SmartBox is available, remove the working table by removing the 4 thumbscrews towards the sides and place the rotary attachment on the bottom tray. Under this condition, we can use either the small or big conical fixtures (for working with bigger objects with diameters 0.5"-1.9" or 3.7"-5.0" respectively).

6) Line up the rotary attachment to the left hand side of the working area and towards the mid-section of the working area.

7) Connect the rotary attachment cable to the rotary attachment port located inside the LaserPro C180's (shown in the picture below).

8) Turn on the machine.



9) Close the front panel.

10) The rotary attachment is now properly installed. Power on the LaserPro C180 and the rotary attachment will be automatically detected and the engraving table will automatically move to its lowest position.

NOTE

For machines without the built-in SmartBox, the rotary attachment is positioned on the working table and the max. diameter of the object is 0.5"-1.9". For machines with built-in Smartbox, the rotary attachment can be placed on the base of the SmartBox and used with the large conical fixtures to engrave objects with larger diameter up to 3.7"-5.0".

OPERATION:

1) Use a ruler to measure the diameter (at the point on the work piece you will be engraving) and length of the work piece you will be engraving. Make a record of this.

2) Load the work piece onto the rotary attachment by first listing the lever on the rotary attachment, unlocking the adjustable end of the rotary attachment. Slide the adjustable end to accommodate the length of the work piece. Load the working piece by centering the open end of the work piece against the rubber wheel and slide the adjustable end to fit the bottom of work piece firmly. Now simply lower the lever to secure the work piece with the rotary attachment.

⚠ CAUTION

If your work piece is small, please apply 2" focal lens for operation to prevent the lens carriage from colliding with the rotary attachment.

3) Prepare the graphic you would like to engrave with the rotary attachment and go to the Paper Page of the C180 print driver.
4) From the Paper Page, the first thing you must do is to check the Rotary Fixture. The Paper Size options and Rotary Parameter will change to allow for proper input based on your rotary attachment.

   a) Under Paper Size, the X value represents the length of your working piece. Enter the length of your work piece in this field.

   b) Under Paper Size, the Diameter value represents the diameter of your working piece (at the position you wish to engrave). Enter the diameter of your work piece in this field. Again remember the proper diameter value would be the diameter location on your work piece you will be engraving.

   c) Under Rotary Parameter, the Offset value represents distance from the open end of your work piece to the base of the padded rubber wheel. This value will be displayed on LaserPro C180's LCD panel. Enter the proper offset value in this field.

NOTE

The maximum diameter and length of the to-be-engraved object is 90 mm and 250 mm respectively. Its maximum weight should not exceed 5kg.

5) Your C180 print driver settings are now properly set. Manually position the laser carriage to the proper X / Y location on the object you will be engraving and position the auto focus pin over the area to be engraved on your work piece. Hit the Auto Focus button and the LaserPro C180 will now properly focus at the location to be engraved.
6) Go back to the print driver to print your design and let the engraving begin.

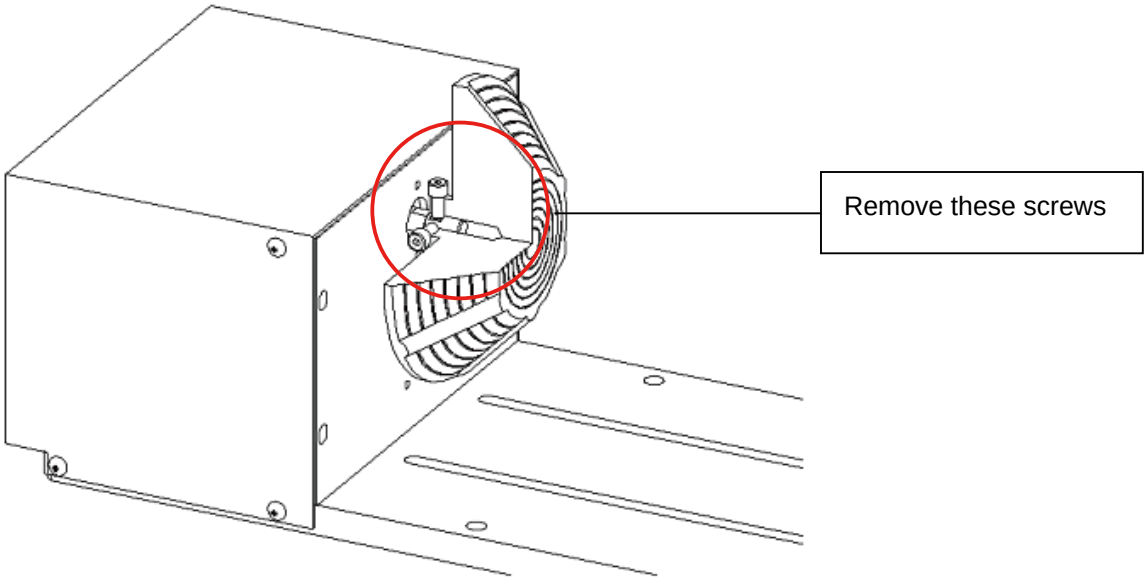
NOTE

The maximum diameter and length of the to-be-engraved object is as follows:

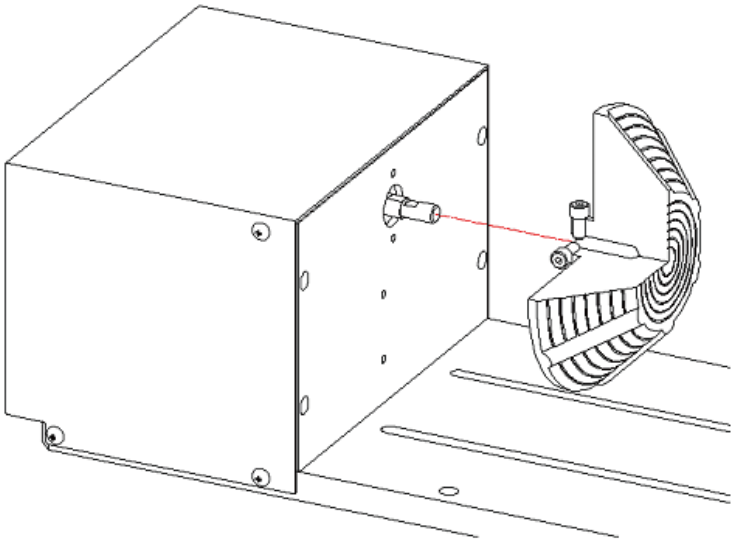
- Small conical fixture: 50 mm and 250 mm.
- Big conical fixture: 127 mm and 250 mm.
- Maximum weight should not exceed 5 kg.

Exchanging the conical fixtures on the rotary attachment:

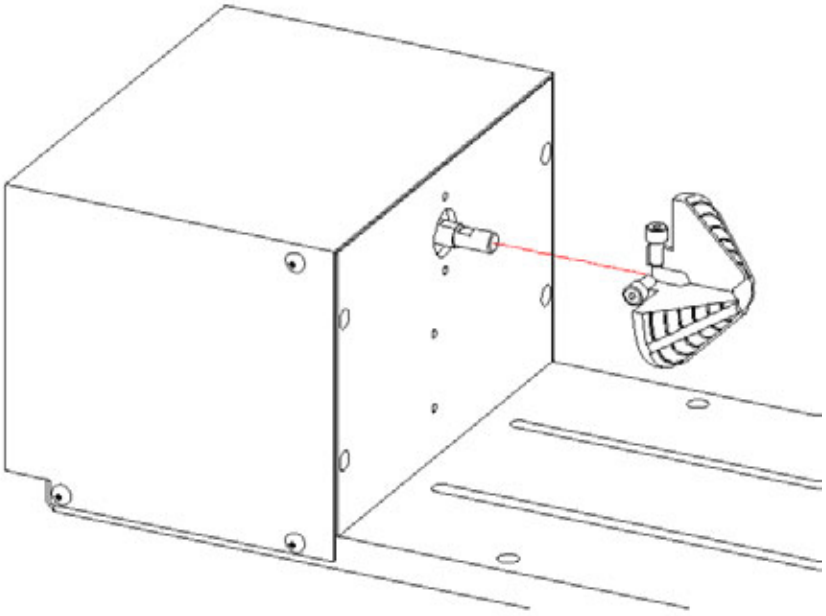
A. Remove the 2 screws shown in the picture below.



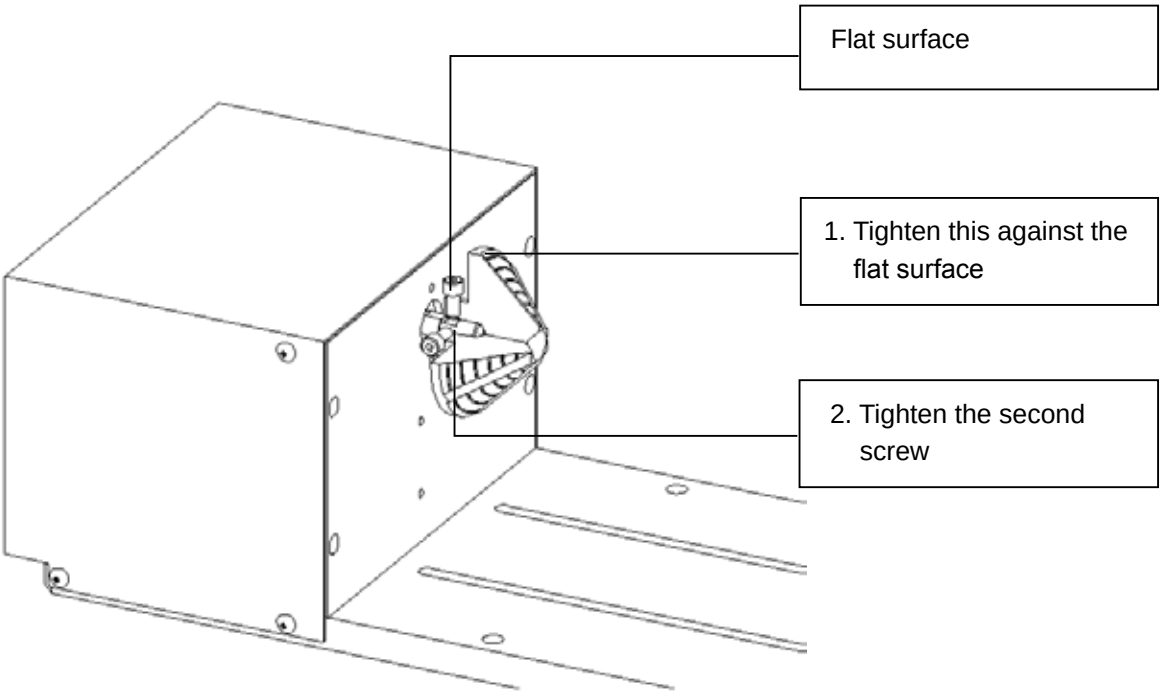
B. Detach the circular cylindrical cone by moving it in the direction of the arrow as shown below.



C. Assemble the smaller conical fixture onto the rotary attachment as shown below.



D. Use the flat surface as shown in picture below as a reference point and tighten the first screw against it. After doing so, tighten the second screw and the rotary attachment is ready for use.



8

Chapter 8

Basic Maintenance

Suggested Cleaning and Maintenance Supplies

Maintaining the Work table and Motion System

- Cleaning the Work table and Motion System
- Lubrication of the Y Rails

Cleaning the Optics System

- Removing the Mirrors
- Cleaning the Mirrors
- Removing and Cleaning the Focal Lens

Keeping your LaserPro C180 clean and well maintained will ensure quality output, consistent reliability, and extended product life. Smoke, dust or residue build-up inside the laser system or the mechanical components can cause a reduction in the laser power, irregularities in the motion system, reduced product life cycle, and a host of other avoidable problems. This section will cover how to perform regular maintenance on the LaserPro C180's worktable, motion system, mirrors, and focal lens.

The frequency of the cleaning schedule will depend on number of variables such as the types of material you work with, the immediate work environment, the frequency of use, the quality of the exhaust system, etc.

WARNING

- Electrical shock may occur if you do not turn off and unplug the C180 before cleaning.
- Damage may occur to the system if you do not turn off and unplug the C180 before cleaning.
- Always turn off and unplug the LaserPro C180 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	Supplied
Lint Free Lens Tissue	Supplied
# 2 Phillips Screwdriver	
Allen Wrench .050"	

8.2 Maintaining the Worktable and Motion System

8.2.1 Cleaning the Worktable and Motion System

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

1) Turn the power off and unplug the C180 before cleaning.
2) Use a vacuum cleaner with a flexible nozzle to remove dust and debris from the worktable 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 C180.

⚠ 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.

Tip

Please clean the AutoFocus pin each time after completing the engraved job to make sure the AutoFocus pin is free to move.

8.2.2 Lubrication of the X / Y Rails

In order to keep the motion system running smoothly, the X / Y rails of the motion system will need lubrication on a semi-regular basis. Use a small amount of light grade machine oil or PS2 grease to a paper or cotton towel and apply to the rails.

You can purchase PS2 grease from NSK dealers worldwide. Please visit http://www.nsk.com for additional information.

NOTE

- Always clean and lubricate the rails after working with materials that produce lots of debris (such as wood).
- Too much oil or PS2 grease applied to the X / Y rails will accelerate the build up of debris.

8.3 Cleaning the Optics System

8.3.1 Removing the Mirrors

We recommend you check the mirrors once or twice a week to see if they require cleaning. If any debris or smoke residue is present, use the following steps to clean them.

NOTE

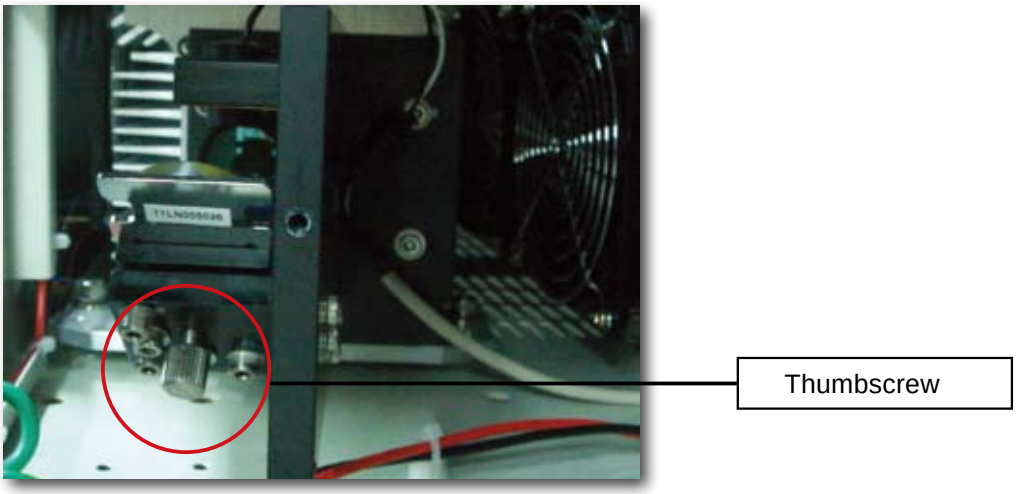
- It is highly recommended you remove, clean and replace each mirror one at a time!
- Refer to section 8.3.2 on how to clean the mirrors.

The following section will detail how to access and remove each of the four mirrors found on the LaserPro C180 for cleaning.

Mirror 1

This mirror is located inside the bottom left access panel of the LaserPro C180.

1) Use a # 2 Phillips Screwdriver to remove the access panel located on the bottom left side of the LaserPro C180.
2) Loosen the thumbscrew and remove the dust cover securing the mirror. (As shown in the picture below).



3) Clean the lens in the proper manner.
4) Re-install the mirror after cleaning.
5) Tighten the thumbscrew.
6) Replace and secure the outer access panel.

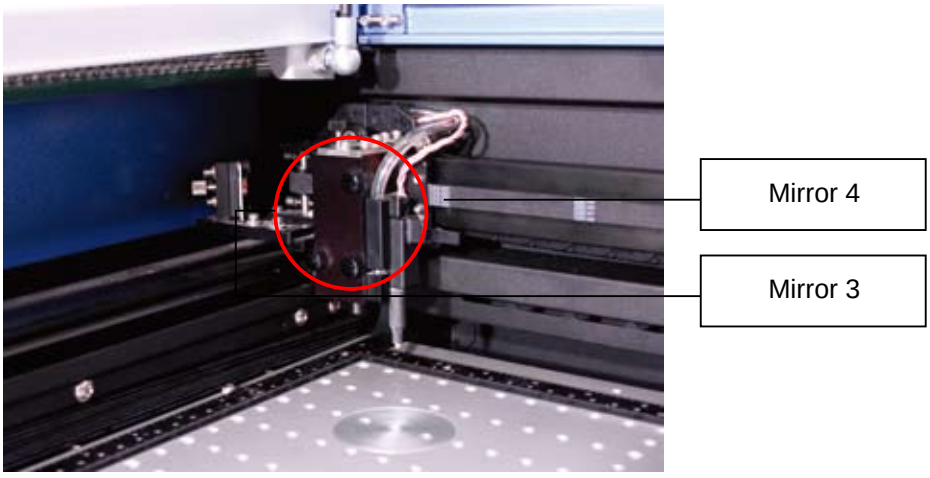
Mirror 2

1) Unscrew and remove the black dust cover covering mirror 2.
2) Unscrew the thumbscrew holding mirror 2 in place.

3) Clean the lens in the proper manner.
4) Re-install mirror 2 after cleaning.
5) Tighten the thumbscrew.
6) Replace and secure the dust cover.

Mirror 3, 4

These mirrors are accessible on the worktable area of the LaserPro C180.

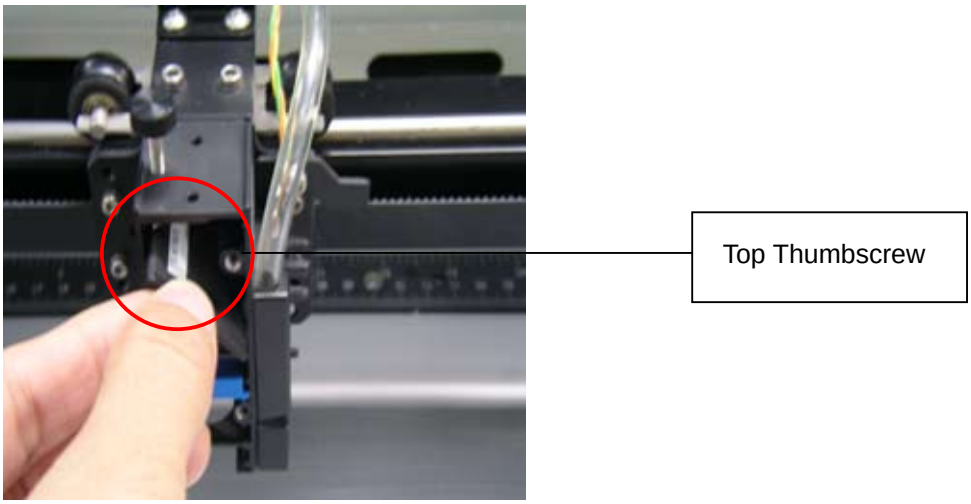


Mirror 3

1) Unscrew the thumbscrew holding mirror 3 in place.
2) Clean the lens in the proper manner.
3) Re-install mirror 3 after cleaning.
4) Tighten the thumbscrew.

Mirror 4

1) Unscrew the three thumbscrews (front face of the laser head) securing the laser carriage panel and remove the laser carriage panel to reveal mirror 4 and the focal lens.
2) Loosen the top thumbscrew to remove mirror 4 (as shown in the picture below).



3) Clean the lens in the proper manner.
4) Re-install mirror 4 after cleaning.
5) Tighten the top thumbscrew.
6) Reinstall the laser carriage panel and tighten the three thumbscrews.

8.3.2 Cleaning the Mirrors

After you have removed each mirror, you will want to inspect each mirror for scratches, smoke residue, or debris. If any residue or debris is present, use the following steps to clean the mirror.

1) Hold the mirror with the reflective side up, without touching the reflective side of the mirror (DO NOT apply any finger pressure or any other cleaning solutions to the mirror surface).
2) Drape a new sheet of lens tissue over the mirror.
3) Apply a few drops of lens cleaner on the tissue covered mirror (apply enough so that the tissue absorbs just enough to cover the mirror surface).
4) Pull the tissue across the mirror in only one direction.
5) Repeat the cleaning processes if the mirror is not completely clean after the first attempt.
6) Make sure that the mirror is completely dry before reinstalling it.

CAUTION

If the center of the mirror is scratched, contact your LaserPro C180 dealer for a replacement.

8.3.3 Removing and Cleaning the Focal Lens

1) Unscrew the three thumbscrews (front face of the laser head) securing the laser carriage panel and remove the laser carriage panel to reveal the focal lens.
2) Carefully pull out the focal lens (as indicated in the picture below).

3) Clean the focal lens with a cotton swab and lens cleaner solution. Be sure to clean both sides of the focal lens (DO NOT apply any pressure or other cleaning solutions to the lens surface).

4) After cleaning, use a cotton swab to gently dry the focal lens and lens cover.

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Chapter 9

Basic Troubleshooting

Quality Problems

- Check focal length setting under Menu function key > Machine Setting > Set Focus Lens to see if it matches the type of the lens installed.
- 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 builds up in the bearing tracks or 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 purpose, the laser beam will not be generated when the top or front door is opened unless you short the connector of the magnetic switches.

NOTE

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

Other Problems

- **Graphic Was Clipped…" Message**

The size or location of graphic image may be bigger or beyond legal working area.
Do not place graphic object, especially vectors, right from (3,0) origin position, or 0 at either x or y rail of working area on application software, Corel Draw for instance, even vector line's width has been set to the thinnest. Because at thinnest line width, it still goes beyond the boarder and causes the error.
If the message appears randomly but frequently even image object is smaller or within the legal boarder, check or change DRAM module, a bad contact or faulty DRAM could cause such error.

- **Auto Focus Pin is Not Functioning**

The focus pin could be stocked by greasy residue that coats on it. Clean the probe with alcohol or acetone. Check the cable of focus pin, there might be a bad contact or breakage.

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Chapter 10

Appendix

Glossary

LaserPro C180 Series Specification Sheet

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.

Error Diffusion (Dithering Method) - This effect uses a series of random black and white pixels to represent shading.

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.

Parallel Cable – The cable connection between the computer and another device (usually the printer). This allows the computer to send several bits of data simultaneously.

Parallel Port – An outlet on your computer or electronic device that allows the computer and device to be connected and share information simultaneously. Another common name for the parallel port is the LPT port.

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.

Raster – The process of rendering a cutting or engraving by multiple horizontal lines. For example: when cutting out or engraving a square, the raster setting will make the laser use numerous horizontal lines to fill in the outlined space.

Raster Image – An image that is defined as a collection of arranged pixels in a rectangular array of lines. A raster image is similar to a "Bitmap" graphics image.

Raster Line – A raster line is the individual horizontal line that makes up the raster image.

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 C180 Series Specification Sheet

LaserPro C180/C180S*	
Work Area	18 x12 in. (458 x 309 mm)
Maximum Part Size (W x L x H)	18 x 12 x 6 in. (505 x 309 x 170 mm)
Table Size	20.5 x 14.8 in. (520 x 375 mm)
Dimensions	28.3 x 25.2 x 14.8 in. (720 x 640 x 385 mm)
Laser Source	12 to 40W Sealed CO_2 Laser
Cooling	Air-cooled, Operating environmental temperature 15^o- 30^o C (60^o - 86^o F)
Drive	Closed-loop DC Servo Control
Maximum Motor Speed	30 IPS
Throughput*	176.3 in^2 / hr (1137 cm^2 / hr)
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)
Z-Axis Movement	Automatic
Resolution (DPI)	Available 125, 250, 300, 380, 500, 600, 760, 1000
Computer Interface	Standard printer port and USB port
Compatible Operating Systems	MS Windows, MAC OS
Memory Buffer	32 MB standard (Upgradeable to 64 MB)
Display Panel	4-line LCD panel showing current file name, total working time, laser poser, engraving speed, file(s) loaded into memory buffer, setup and diagnostic menus
Safety	Class 3R for red pointer
Facility Requirements	
Electrical	Below 40 Watt, 100~240 Volt AC Auto Switching; 40Watt and above, 200~240 Volt AC Auto Switching
Power Consumption	700W- 2640W
Air Exhaust System	External exhaust system required, one 2" connection on the back of the machine.

*C180S excludes LED lighting, internal bellows, and Built-in SmartBox™. For C180S without built-in SmartBox™, the rotary attachment is positioned on the working table, and the max. diameter of the object is 0.5"-1.9".