



Laser Engraver and Cutter CR Series

Operating Manual



Version 1.0 (2022.05)

PREFACE

Dear Customer:

Thank you for choosing Cloudray Laser System.

This fiber laser marking machine is intended for personal and professional use.

Cloudray is committed to providing the highest level of customer satisfaction and support. To ensure a favorable customer experience, we urge you to thoroughly read the documentation provided with your equipment.

Your satisfaction is essential to us, and we welcome your feedback. Tell us about your experience with Cloudray Laser Systems and our products.

Should you have any questions, please email the Cloudray Support Team.

Again, thank you for choosing Cloudray.

Sincerely,

Cloudray Laser



Cloudray cannot be held responsible for any direct or indirect damages, which result from using or working with the products electric circuits or software described herein. The apparatus must be used only by trained and skilled personnel. Before use the manual should be read and followed carefully.

Furthermore, Cloudray reserves the right to change or alter any product described herein without prior notice.

Document History

Version	Date	Content
V1.0	05/2022	V1.0 official version released

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1. General Information

For reasons of better legibility, gender-neutral form of address (e. g. "he/she") are not used in the operating manual. It is expressly stated that in all text passages where natural persons or groups of persons are mentioned, people of both sexes are always meant.

1.1. Information about this manual

Before beginning any work on the machine, read this manual completely and carefully.

Keep the manual for further consultation close to the machine.

This manual describes how to operate the machine properly and safely. Be sure to follow the safety instructions given here, as well as any local accident prevention regulations and general safety regulations applicable to the field of usage. Before beginning any work on the machine, ensure that the manual, in particular the chapter entitled "Safety Information" and the respective safety guidelines, has been read in its entirety and fully understood.

Storage of the manual

This manual is an integral part of the machine and must therefore be kept in the direct vicinity of the machine and be accessible at all times.

Complementary documentation

Complementary documentation can be found on the supplied U Disc.

1.2. Explanation of symbols

Important technical safety notes and instructions in this manual are indicated by symbols. It is important to observe and follow these notes and instructions on workplace safety. Avoid accidents, personal injury, and material damage to property by acting with extreme caution.



Caution!

This symbol indicates a potentially hazardous situation. Not observing these notes may result in personal injury or damage to equipment.



Caution!

Dangerous electrical voltage - indicates a risk of electric shock and warns of imminent danger to the life and health of individuals or of significant damage to equipment.



Caution!
Laser beam - means that the laser machine may operate in laser class 4 when commissioning the laser head. Warns of damage to eyes or skin caused by direct or scattered radiation.



Important: Information the user must observe or know to avoid process disruptions or malfunctions when using the product.



Tip: Gives the user the information needed to achieve the objective directly and without problems.



Protective eyewear should be worn by anyone around this machine during operation.



This product contains electrical components that should not be disposed of with regular garbage.

1.3. Liability and warranty

Warranty periods specified in the manufacturers "warranty terms and conditions" shall be binding for the buyer. If no warranty periods are specified, the general terms and conditions of sale, delivery and payment apply.

All information, illustrations, tables, specifications and diagrams contained in this operating manual have been carefully compiled according to the current state of technology. No liability is accepted with regard to errors, missing information and any resulting damage or consequential loss.

Strict compliance with the safety procedures described in this operating manual and extreme caution when using the equipment are essential for avoiding and reducing the possibility of personal injury or

damage to the equipment. The manufacturer shall not be liable for any damage and or faults resulting from nonobservance of instructions in this manual.

Nonobservance of the operation, maintenance and service instructions described within this manual absolves Cloudray (Jiangsu) Co., Ltd. from any liability in case of a defect.

Furthermore, Cloudray (Jiangsu) Co., Ltd. shall accept no liability whatsoever for damage caused by the use of non- original parts and accessories.

Additionally, Cloudray (Jiangsu) Co., Ltd. shall not be held responsible for any personal injury or property damage, of an indirect or specific nature, consequential loss, loss of commercial profits, interruption to business, or loss of commercial information resulting from use of the equipment described in this manual.

It is strictly prohibited to make any alterations, to prepare translations, decompile, disassemble, reverse engineer or copy the software.

Cloudray (Jiangsu) Co., Ltd. reserves the right to update any of the information, illustrations, tables, specifications and diagrams contained in this operating manual with regard to technical developments at any time without notice.

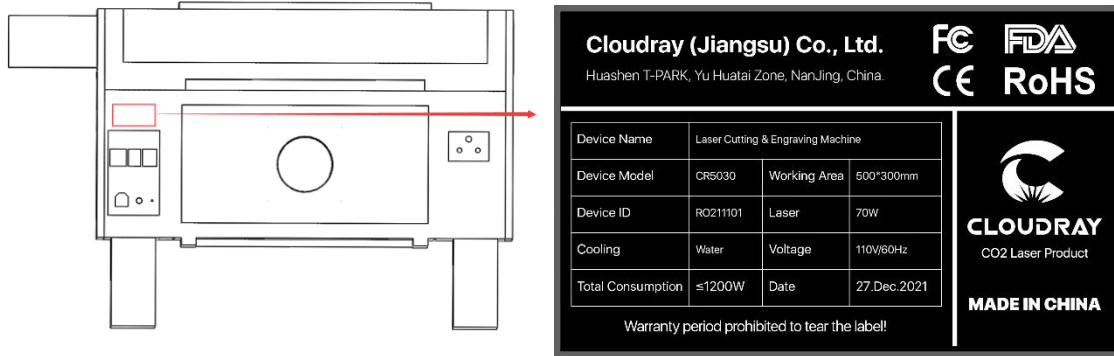
1.4. Scope of delivery (standard configuration)

1. Laser machine
2. U-Disc (with laser software, printer driver and operating manual)
3. Industrial Chiller
4. Air Exhaust Fan
5. Air Compressor
6. Power cable
7. USB computer connection cable
8. Ethernet computer connection cable
9. Hex Wrenches
10. Screwdriver

The actual scope of delivery may be different, depending on the special model, additional order options or newest technical changes.

1.5. Manufacturer's Label

The Manufacturer's Label is located on the side/backside of the machine (see picture below)



1.6. Complementary Documentation

Complementary documentation can be found on the supplied U-disc:

- Laser Engraver and Cutter CR Series Operating Manual
- RDWorkV8 User Manual V1.3
- RDC6432 User Manual

1.7. EC–Declaration of Conformity

Declaration of Conformity



For the following equipment :

Product Name : Laser Cutting & Engraving Machine

Model Name: CR3020, CR5030, CR6040, CR7050, CR9060, CR1390, CR1610, CR1810, AR9060, AR1390, AR1610, AR1070, SR3020, SR5030, SR6040, SR7050, SR9060, SR1390, SR1610, SR1070

Applicant: Cloudray (Jiangsu) Co., Ltd.

Address: Room 101, 3-A, No.10 Huashenmiao, Huashen T-Park, Yuhuatai Zone, Nanjing, Jiangsu, China 210012

Is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (LVD Directive 2014/35/EU and MD Directive 2006/42/EC) For the evaluation regarding the electromagnetic compatibility , the following standards were applied:

LVD EN 60204-1:2018
MD 2006/42/EC Annex I: EN ISO 12100:2010

The following manufacturer/importer is responsible for this declaration:

Person responsible for marking this declaration:

Nanjing, China
01.03.2022

Rayner DING
General Manager



2. Safety Information

2.1. Disclaimer

Your engraver may differ somewhat from those shown in this manual due to options, updates, etc. Please contact us if your marking machine came with an outdated manual or if you have any other questions.

2.2. General Safety Instructions

- Use this laser marking device only in accordance with all applicable local and national laws and regulations.
- Use this device only in accordance with this instruction manual and the manual for the engraving software included with it. Only allow this device to be installed, operated, maintained, repaired, etc. by others who have also read and understood both manuals. Ensure that this manual and the software manual are both included with this device if it is ever given or sold to a third party.



- **DO NOT** operate this device continuously for more than 5 hours. Stop every 5 hours for at least ½ hour.
- **DO NOT** leave this device unattended during operation. Observe the device throughout operation and, if anything seems to be operating strangely, immediately cut off ALL power to the machine and contact either our customer service or your dedicated repair service. Similarly, ensure the device is FULLY turned off in the correct order after each use.
- **DO NOT** allow minors, untrained personnel, or personnel suffering from physical or mental impairment that would affect their ability to follow this manual and the software manual to install, operate, maintain, or repair this device.
- Any untrained personnel who might be near the device while it is in operation **MUST** be informed that it is dangerous and fully instructed on how to avoid injury during its use.
- Always keep a fire extinguisher, water hose, or other flame retardant system nearby in case of accidents. Ensure that the local fire department's phone number is clearly displayed nearby. In the case of a fire, cut electrical power before dousing the flame. Familiarize yourself with the correct range for your extinguisher before use. Take care not to use your extinguisher too close to the flame, as its high pressure can produce blowback.

2.3. Laser Safety Instructions

This machine uses an invisible CLASS 4 LASER, the strongest and most dangerous class of laser available for public use. Used without care, it can cause serious property damage and personal injury including but not limited to the following:



- The laser will easily burn nearby combustible materials
- Some working materials may produce radiation or harmful gasses during processing
- Direct exposure to the laser will cause bodily harm including serious burns and irreparable eye damage

As such,

- **NEVER** interfere with the laser beam.
- **DO NOT** place any part of your body under the laser lens during operation. Take measures to protect yourself from potentially reflected laser beams including the use
- **NEVER** attempt to view the laser directly without protective eyewear. Always wear safety goggles or glasses designed to filter the specific wavelength of your engraver's laser with an optical density (OD) of 5+. As even seemingly matte materials can produce harmful reflected beams, care should be taken to keep anyone without protective eyewear from observing the machine during operation. **EVEN WITH** protective eyewear, do not stare or allow others to stare continuously at the laser beam during operation.
- **DO NOT** leave potentially combustible, flammable, explosive, or corrosive materials nearby where they could be exposed to the direct or reflected laser beam.
- **DO NOT** use or leave sensitive EMI equipment nearby. Ensure the area around the laser is free of strong electromagnetic interference during any use.
- **ONLY** use this machine as described in the Material Safety section of this manual. The laser settings and engraving process must be properly adjusted for specific materials.
- Ensure the area is kept free of airborne pollutants, as these might pose a similar risk of reflection, combustion, etc.
- **NEVER** use this marking machine with the fiber source's housing opened, as the closed laser light path is necessary to prevent laser radiation leakage.
- **DO NOT** modify or disassemble the laser and do not use the laser if it has been modified or disassembled by anyone except trained and skilled professionals. Dangerous radiation exposure and other injury may result from the use of adjusted, modified, or otherwise incompatible equipment.

2.4. Electrical Safety Instructions

- **ONLY** use this device with a compatible and stable power supply with less than 5% fluctuation in its voltage.



DO NOT connect other devices to the same fuse, as the laser system will require its full amperage. Do not use with standard extension cords or power strips. Use only surge protectors rated over 2000J.

- **ONLY** turn on the power to this device when it is well grounded, either via a firm connection to a 3-prong outlet or via a dedicated grounding cable firmly connected to the proper slot on the back of the main tower. Do not use with an ungrounded 3 to 2 prong adapters. The device's grounding should be checked regularly for any damage to the line or loose connections.
- Turn the device on and off using its key and power buttons in the correct order. The mainboard, galvo, and laser have separate power supplies that are grounded in order. Activating everything at once, too quickly, or in the wrong order may send electrical current to an ungrounded component, causing short circuits and other electrical hazards.
- **ONLY** use this device with one hand at a time. The laser is powered by an extremely high voltage connection and placing two hands on the machine at one time during operation has the potential to create a closed circuit with the human body, resulting in electrical shock.
- The area around this laser marking device should be kept dry, well ventilated, and environmentally controlled to keep the ambient temperature between 40–95°F (5–35°C). The ambient humidity should not exceed 70%.
- Adjustment, maintenance, and repair of the electrical components of this device must be done **ONLY** by trained and skilled professionals to avoid fires and other malfunctions, including potential radiation exposure from damage to the laser components. Because specialized techniques are required for testing the electrical components of this marking system, it is recommended such testing only be done by the manufacturer, seller, or repair service.
- Unless otherwise specified, **ONLY** undertake adjustment, maintenance, and repair of the device when it is turned off and disconnected from its power supply.

2.5. Machine identification (warning and safety stickers)

The warning and information labels are attached in the positions of the machine that could represent a source of danger during set-up and operation. Therefore, pay attention to the information on the labels.

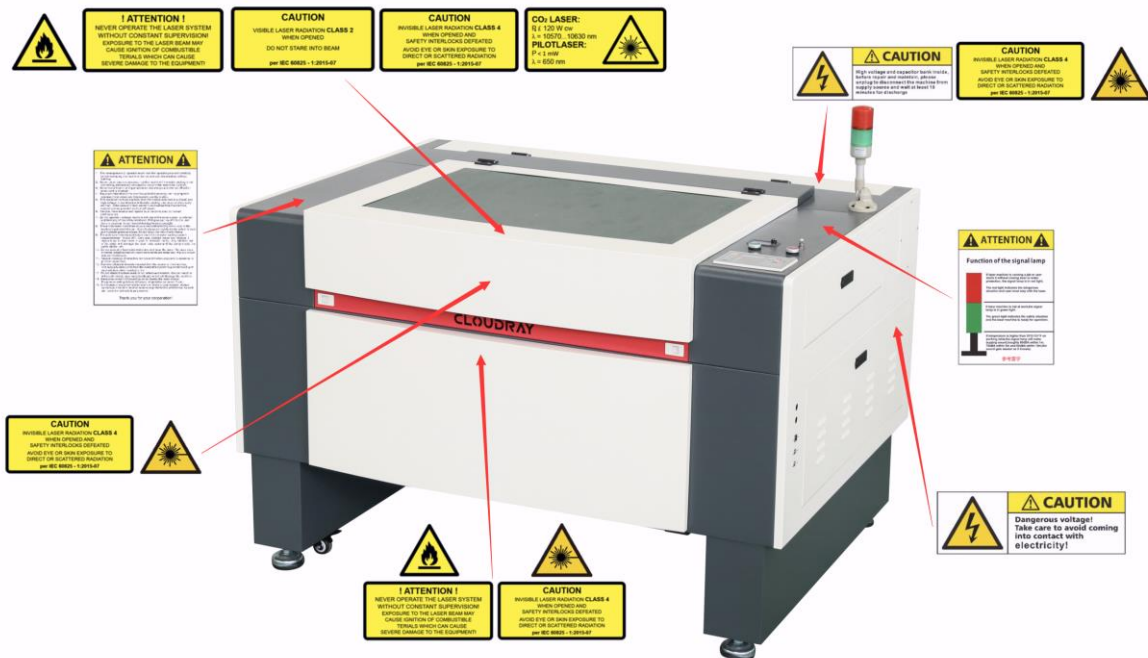


Caution

Lost or damaged warning and safety stickers.

If any warning and safety stickers are lost or damaged, the user is not able identify risks anymore, and there is danger of injury.

- Replace lost or damaged labels immediately.
- Contact your Cloudray (Jiangsu) Co., Ltd. dealer for details.

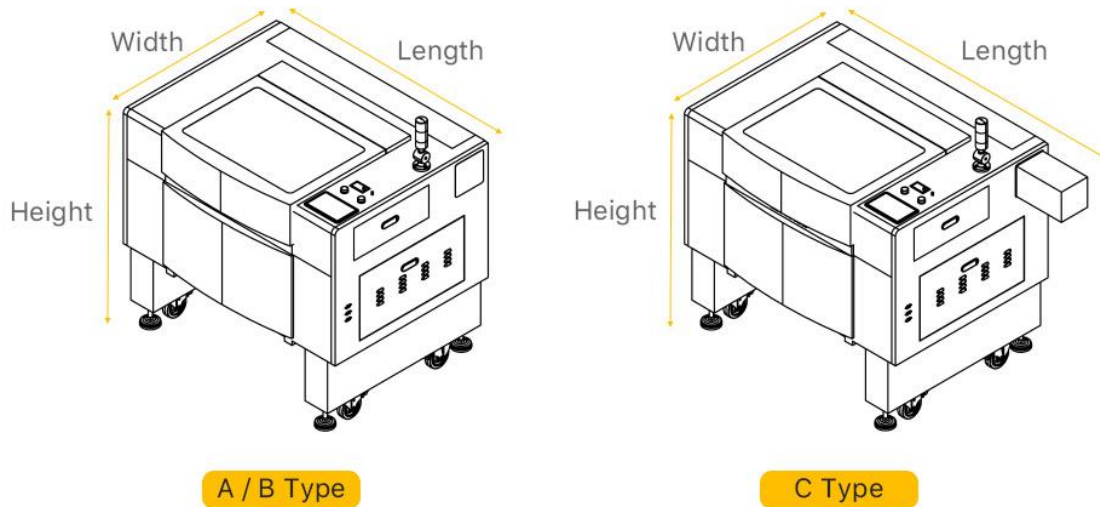


3. Technical Specifications

3.1. Electrical requirements of the machine

	CR6040 (CR2416)-A	CR7050 (CR2820)-A	CR7050 (CR2820)-C	CR9060 (CR3524)-B
Cutting Area	23.6" X 15.8" (600 X 400 mm)	27.6" X 19.7" (700 X 500 mm)	27.6" X 19.7" (700 X 500 mm)	35.4" X 23.6" (900 X 600 mm)
Laser Power	Cloudray CR55 55 watts		RECI W4 100 watts	RECI W2 90 watts
Power Supply	AC 110V 60Hz			
Material Platform	Equipped With Honeycomb & Kniff Blade Cutting Platforms			
Chiller	S&A CW3000		S&A CW5200	
Software	Rdworks V8 Lightburn™ Software*			
Class	Class 4 Laser			
Motor Type	Nema 23,34 Steppers			
Z Table	Push Button Lower Or Raise 10"			
Venting Attachments	Air Exhaust Fan With Venting Pipe			
Os Compatibility	Windows (32 Or 64 Bit), Linux, Or Mac OS			
Warranty	2-Years			
Rail Type	Internal Sliding Rail, Linear Guide			
Work Table Capacity	300LB. Static, 200LB. Lifting			
Laser / PC Connectivity	USB Connect, Ethernet Or WIFI Option			
Material Capability	Organics / Non-Metals + Coated Metals			

3.2. Dimensions and weight



Model		Length	Width	Height	Weight	
CR6040 (CR2416) -A	mm	1130	820	930	kgs	200
	inch	44.5	32.3	36.6	lbs	441
CR7050 (CR2820) -A	mm	1230	920	930	kgs	240
	inch	48.4	36.2	36.6	lbs	529.1
CR7050 (CR2820) -C	mm	1580	920	930	kgs	260
	inch	62.2	36.2	36.6	lbs	573.2
CR9060 (CR3524) -B	mm	1430	1020	930	kgs	320
	inch	56.3	40.2	36.6	lbs	705.5

3.3. Computer requirements

Using a more powerful computer will create graphics faster. Computing times become shorter and data transfer faster.

The following recommendation represents the minimum requirements:

Cloudray Laser System

- Operating systems:
Windows 10® 32 / 64-bit
Windows 8.1® 32 / 64-bit
Windows 7® 32 / 64-bit
- Microsoft® .NET framework 3.5
- Microsoft® .NET framework 4.7.2
- Adobe® Reader 9.0 or later
- Local administrator privileges (for required software installations)
- 2 GHz processor or faster
- 2 GB RAM or greater (Windows 7 / 8.1 / 10)
- 80 GB hard driver or larger
- 1024 x 768 monitor resolution or greater
- True Color graphics card (24-bit color depth)
- 2 free USB interfaces

3.4. Materials

List of material			
Material EN	Cutting	Engraving	Marking
Metal			
Aluminum, anodized			✓
Metal, painted		✓	
Plastic			
Acrylonitrile butadiene styrene (ABS)	✓	✓	
Acrylic/PMMA,	✓	✓	
Rubber	✓	✓	
Polyamide (PA)	✓	✓	
Polybutylene terephthalate (PBT)	✓	✓	
Polycarbonate (PC)	✓	✓	
Polyethylene (PE)	✓	✓	
Polyester (PES)	✓	✓	
Polyethylene terephthalate (PET)	✓	✓	
Polyimide (PI)	✓	✓	
Polyoxymethylene (POM) -i.e.	✓	✓	
Polypropylene (PP)	✓	✓	
Polyphenylene sulfide (PPS)	✓	✓	
Polystyrene (PS)	✓	✓	
Polyurethane (PUR)	✓	✓	
Foam (PVC free)	✓	✓	
Miscellaneous			
Wood	✓	✓	

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Stone		✓	
Paper (white)	✓	✓	✓
Paper (colored)	✓	✓	✓
Food	✓	✓	✓
Leather	✓	✓	✓
Fabric	✓	✓	
Glass		✓	
Ceramics			✓
Cardboard	✓	✓	✓
Cork	✓	✓	✓

4. Machine overview

4.1. General overview





5. Setup and installation

5.1. Temperature and humidity

Ambientes conditions

Operating temperature:	+15 °C to +25 °C (59 °F to 77 °F)
Relative humidity:	45% to 65%, non-condensing

Environmental conditions

- Provide sufficient illumination at the workplace.
- Ensure a dust-free environment (II° according to IEC60947-1).
- Shielding from EMC.
- Freedom of interfering electrical installations, hoses and pipe lines.
- Power supply free of fluctuations.

5.2. Before Installation

- Take out the sponge around the laser tube.
- Remove the nylon cable ties around the honeycomb plate or blade.
- When you have the machine in its final position, please be sure to re-fix the feet in all four corners.

5.3. Connections



Caution!

Install the connections exactly in the order described, otherwise electrostatic charging can damage your computer and/or the electronics of the laser system

5.3.1. Mains connection

- Connect the end of the mains connection cable to the main connection socket.



Warning Current!**Wrong voltage can cause damage to the machine.**

Do not operate the machine, if the mains voltage does not match the voltage required by the exhaust system, as this may cause damage to the machine.

Make sure that the mains voltage matches the voltage required by the exhaust system.

5.3.2. PC connection

- USB Cable Connection
- Ethernet Cable Connection

5.3.3. Air compressor connection

- Connect the PU hoses between the air compressor and the machine.
- Connect the power cable (of the air compressor) to the machine.

5.3.4. Air exhaust fan connection

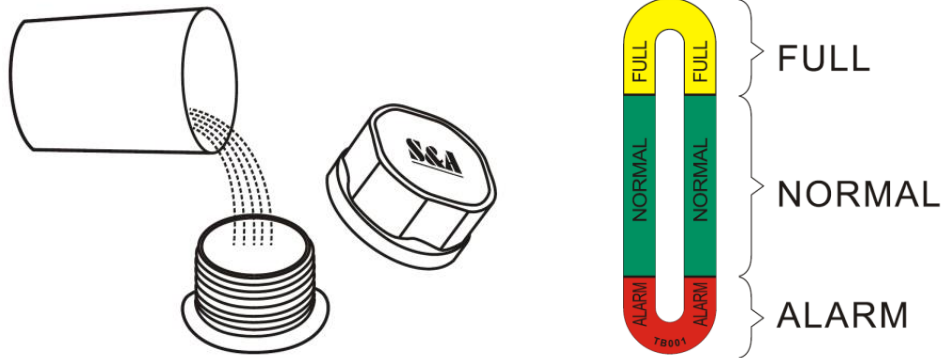
- Use the exhaust pipe to connect the fan inlet to the exhaust port on the back of the machine.
- Use an additional exhaust pipe to connect the fan's air outlet to a suitable exhaust space.
- Connect the power cable (of the air exhaust fan) to the machine.
- A fume extractor is recommended, it can maintain the air quality of your work environment well.

5.3.5. Chiller connection

- Connect one of the water pipes to the water chiller port which marked as "OUTLET";
- Connect another water pipe to the water chiller port which marked as "INLET";
- Connect the power cable (of the chiller) to the machine.

Cloudray Laser System

- Add pure water (distilled) into the chiller until the water level in the green area showing on the gauge.
- Keep the chiller running for a period, the water will full fill into the laser tube. Then re-fill water to keep the water level in the green area.



6. Operation

6.1. Before commissioning

6.2. Power ON/OFF

The following conditions must be fulfilled for correct start up:

- Unrestricted freedom of motion of the mechanics.
- No materials under the engraving table.
- Protection covers closed.

When turn on the power of machine, and note that turn on the main switch first and then the laser supply power switch;

When turn off the power of machine, and note that turn off the laser supply power switch first and then the main switch;

6.3. Software installation

6.3.1. RDWorksV8

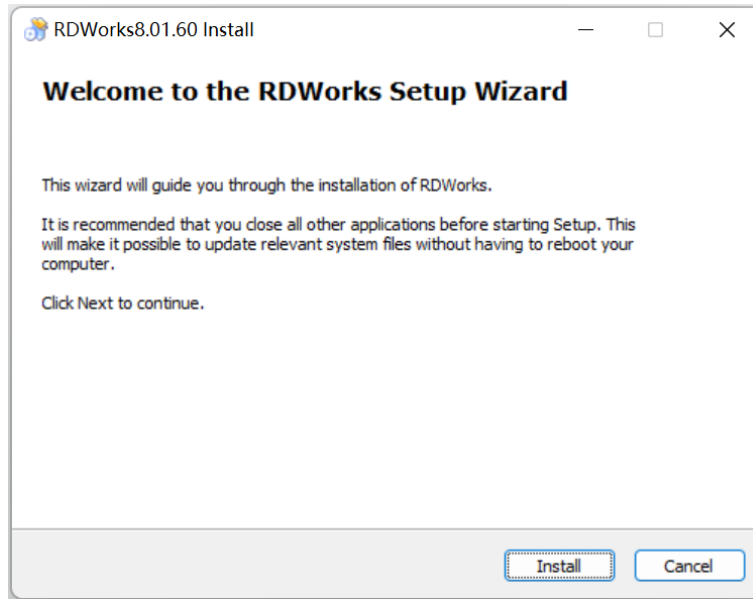
See the “RDWorkV8 User Manual” for more detailed instructions.



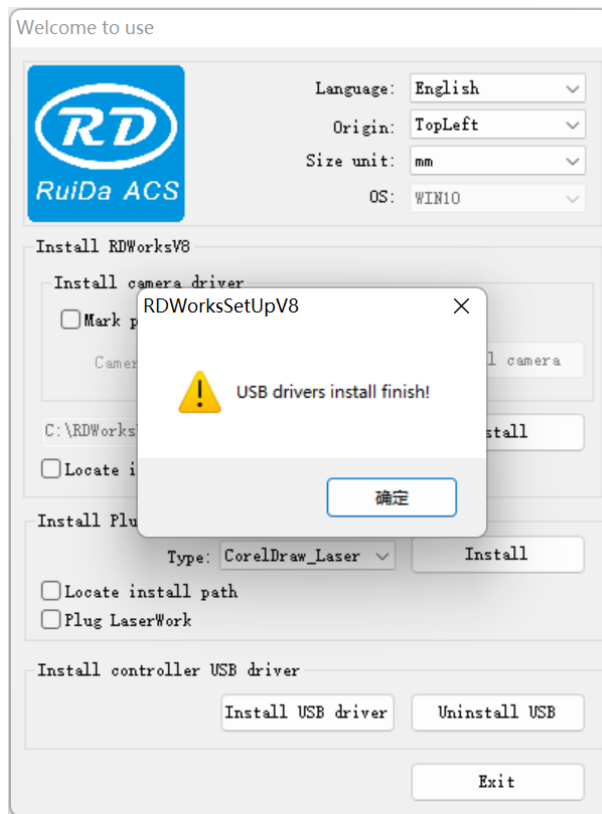
Trouble shooting for RDWorksV8 installation

Your Anti-Virus software may block the RDWorksV8 installation. Please disable all Virus and Spyware Protection Features. After the RDworksV8 has been installed go back into your Anti-Virus software and re-enable the Anti-Virus software.

To install the software, insert the U-disc and you will find the installation file "RDWorksV8Setup.exe". Run this file by double-clicking on your PC.



If you use USB cable connection, please install the USB driver.



After "Install Finish!", a "RDWorksV8" icon  will be automatically added to your Desktop, you are now ready to use the RDworksV8.

6.3.2. Lightburn

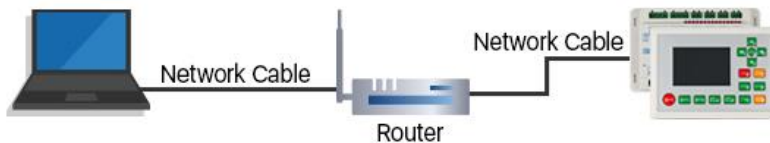
PLEASE VISIT WWW.LIGHTBURNSOFTWARE.COM TO FIND RESOURCES FOR INSTALLING LIGHTBURN.

6.3.3. PC and machine connection

- USB cable connection
- Ethernet cable connection

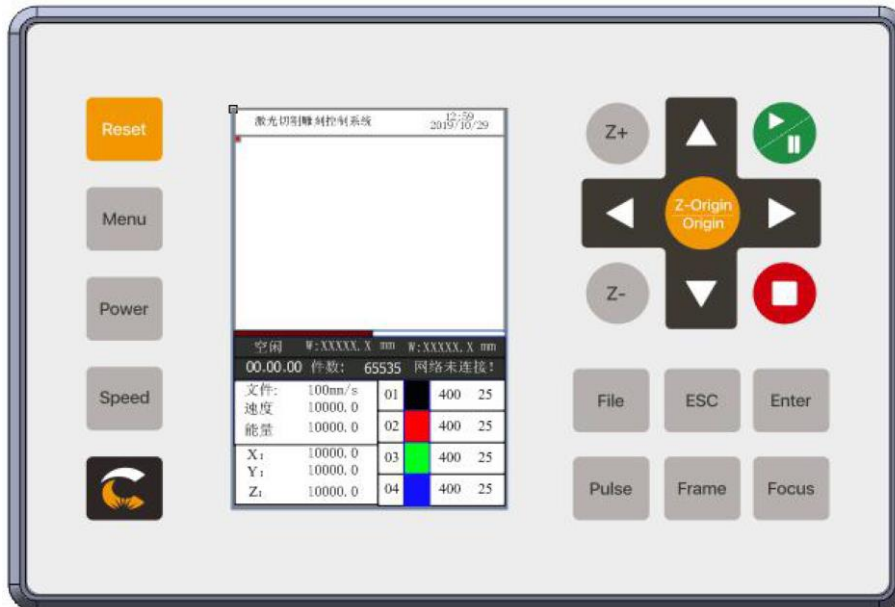


1. Set the IP address as 192.168.X.Y in Panel and Software RDworks. For example, IP is **192.168.8.8**.
Panel: Gateway is 242.57.0.0.
2. When connecting the main board and PC terminal through network cable, the computer IP should be modified to make the computer IP address and IP address of the main board in the same network segment. The last 8bit value for IP address should be **1 - 49**. For example, the computer IP address can be set to **192.168.8.28**.



1. Set the IP address as 192.168.X.Y in Panel and Software RDworks. For example, IP is **192.168.8.8**.
Panel: Gateway is 242.57.0.0.
2. When connecting the main board and PC terminal through network cable, the computer IP should be modified to make the computer IP address and IP address of the main board in the same network segment. The last 8bit value for IP address should be **1 - 49**. For example, the computer IP address can be set to **192.168.8.28**.
The DNS on the computer side needs to be set to match the router.

6.4. Control Panel Operation

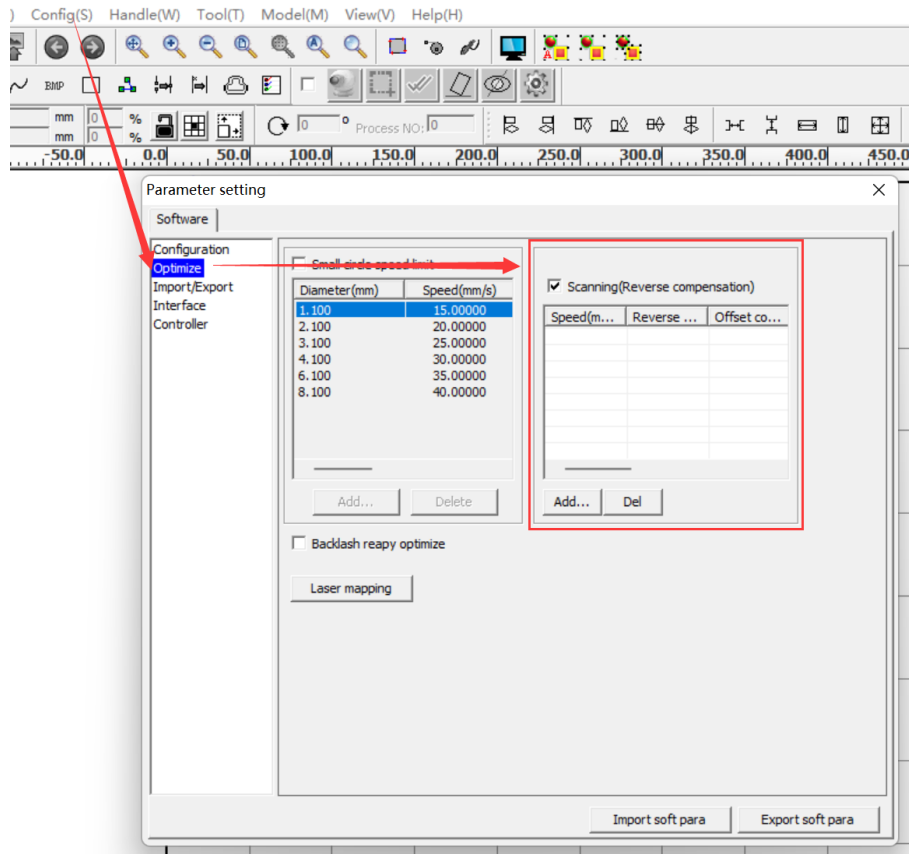


See the “RDC6432 User Manual” for more detailed instructions.

6.5. The First Time Running

1. Switch on the water chiller. Check the water cooling system is working properly and make sure the water is running and full-filling the laser tube.
2. Switch on your Laser and the laser head will do the reset and find the home from top left corner. (Turn on the Main switch first and then the Laser switch).
3. After machine finish resetting, adjust the height of working table; Place the material usually on the top left corner of the working table.
4. Adjust the correct focus distance between the bottom of laser head and the material manually by move up and down the working table.
5. Open the software RDworksV8.First to set up the values on the “Scanning (Reverse compensation)” check box.

Setting Route: Open Config(s) - System Setting - Optimize - Scanning(Reverse compensation).



6. Create sample text for engraving directly on RDworksV8; Set up the engraving / cutting parameter and download the file to your machine.
7. Click “Original” and “Frame” button on the control panel. Make sure that the material is in the correct position.
8. Click “Start-Pause” to start the job; (Please do not start the job if the laser tube isn’t full of water, or it may lead to laser tube damage.)
9. When the job is finished, the laser head will go back to the original point.

7. Maintenance

7.1. Maintenance schedule

System Components	Daily	Weekly	Half-yearly	Yearly
Lens, mirror #4	✓			
Mirror #2 and mirror #3			✓	
Ultrasonic sensor (option)	✓			
Working table and rulers.	✓			
Vent slots of exhaust box. (inside the machine)	✓			
Entire working area. General cleaning.		✓		
Vent slots (backside of the machine)			✓	
Spindles				Clean and grease.
Cover of the laser source and housing.		✓		
Inside of the exhaust box.			✓	