





AURORA Series Unified User's Manual For AURORA 8 & 8 PRO

Thunder Laser

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Room



This manual has been designated as a user's guide for thunder laser systems and fiber laser machine installation; The manual is divided into eight chapters, including General Information Instructions, Safety Instructions, Key Components of every Laser Systems and the Installation Steps, Operation Instructions and Maintenance Instructions from THUNDERLASER Company.

It should be emphasized that the installation of each system must meet the requirements, and be consistent with the installation requirements of THUNDERLASER. If not, the machine won't work properly, manifested as poor performance, shortened life-span, increasing maintenance costs and even damage to the machine.

The note is about some specific requirements during system installation, and we hope every customer could try to understand these notes before installation and usage, so that you can correctly install and use it. If you meet any problems during installation, you can contact our technical personnel or Customer Service.

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Chapter 1. General

1.1 General Information

Please read this documentation carefully before installation and operation.

Injury, death, property loss, fire, electric shock, malfunction, reduced performance & machine

life-span, and serious failures might happen unless you read, understand, and follow the

Operation Manual!

Operation of the system is permitted only with equipment and spare parts supplied or listed in the List of Spare

Parts and Consumables. The use of components from the 3rd Party may invalidate the warranty.

Auxiliary equipment must be adjusted to the base machine (contact us for further info).

The following symbols are used throughout the Operation Manual:



Caution: When operating the laser, keep alarmed all the time.



High Voltage: Be careful to prevent injury and/or death.



Laser Radiation: Keep away from the dangers of the laser beam.



Fire Hazard: High potential for fire. NEVER LEAVE IT UNATTENDED WHEN RUNNING!



Tips: Helpful notes or info can make it easier to use or understand.

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1.2 Designated

The THUNDER LASER AURORA SERIES is intended exclusively for laser marking through the supplied marking software.

Materials such as metal, anodized aluminum, and several plastics can be processed by the laser.

As part of the intended use, the following points should also be observed:



1. The engraving process must only be performed with a perfectly adjusted machine.

- 2. Only mark approved materials with suitable parameters.
- 3. Use of the system in other areas is against the designated use. The manufacturer does not admit liability for damage to personal and/or equipment resulting from such use.

4. The system must only be operated, maintained and repaired, by personnel that are familiar with the designated field of use and the dangers of the machine!

5. Non-observance of the instructions for operation, maintenance and repair described in this operation Manual excludes any liability of the manufacturer if a defect occurs.

6. Caution when processing conductive materials (carbon fibers), conductive dust or particles in the ambient air might damage electrical components and lead to short circuits. Bear in mind that those defects are not warranted.

1.3 Disposal remarks



Do not dispose the machine with house refuse!

Electronic devices have to be disposed along with electric waste disposal according to the regional directives on electronic. For further questions, please ask your supplier. He might handle it properly.

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1.4 Technical Parameter/Device Specification

Mechanics

	AURORA 8		AURORA 8 PRO		
Max marking area	200*200mm/7.9″				
Max working area		200*20	0mm/7.9″		
Lens(Fiber and Mopa)	Marking area	Max work height	Focus diame	eter	Focus length
F-160	4.3"×4.3"/110×110mm	8.3"/213mm	26µm		6.9″/176mm
F-210	5.7"×5.7"/145×145mm	5.0"/127mm	24µm		9.1"/232.5mm
F-290	7.9"×7.9"/200×200mm	2.5"/66mm	35µm		12.7"/324mm
Lens(UV)	Marking area	Max work height	Focus diame	eter	Focus length
F-160	4.3"×4.3"/110×110mm	7.4"/190mm	10µm		200mm
F-210	5.7"×5.7"/145×145mm	5.3"/135mm	17µm		252mm
F-290	7.9"×7.9"/200×200mm	1.9″/50mm	16.5µm		336mm
Max marking speed	7m/sec, 70	7m/sec, 700cps 10m/sec, 1000cps			
Z-axis		Motorized Z-a	kis, 16.9″/430mm		
Table		Alumina table, 14.7	7"×11.3"/375×288	mm	
Net weight	UV Series: 92.5kg/203lbs 89.3kg/196lbs 93.7kg/206lbs			.7kg/206lbs	
Housing	29.7"×16.9"×31.4"/755*430*799mm				
dimensions(W*D*H)	(UV Series: 30.3″×16.9″×31.4″/770*430*799mm)				
PS	AURORA 8	is fitted with F-160 a	s standard, and 8	PRO with	F-210.
го	The UV Series is fitted with F160 as standard.				

Laser Equipment

		AURORA 8&AURORA 8 PRO				
Laser power	UV 5w	fiber 20w	fiber 50w	20w(MOPA)	60w(MOPA)	100w(MOPA)
Wavelength	355nm	1064nm				
Frequency	20-150kHz	20-60kHz	50-100kHz		1-4000kHz	
Pulse width	1	1	/		2-500ns	
Q-pulse width	1-50µs	1				
Cooling		Air cooled				
Red dot pointer		Laser Power<1mW, 630-680nm				

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Control System

	AURORA 8	AURORA 8 PRO		
Computer	Microsoft Windows XP, VISTA, Win7, Win10			
Interfaces	US	USB		
Marking software	EzCad2	EzCad3		
Correction software	CorFile2	Calibration Wizard		
Auto-focus software	TL-tool			
	Fiber 20, 50W adjustable from 10% - 100%			
Laser power	MOPA 20W, 60W adjustable from 0 - 100%			

Electricity, Power, Breaker

	UV 5W	20WATT	50WATT	20WATT(MOPA)	60WATT(MOPA)	100WATT(MOPA)
Electricity requirement			110~240 V	olt AC, 50 or 60Hz,	Single phase	
Power consumption	300W	230W	340W	225W	256W	378W
Current	3A, 115V 2A, 220V	2.5A, 115V 1.5A, 230V	3.5A,115V 2A, 230V	2.5A,115V 1.5A,230V	3.5A,115V 1.6A,230V	3.7A,115V 2.1A,230V
Recommended circuit breaker				10A		

Ambient Conditions

Ambient temperature

Humidity

Laser Safety

Laser class

Operating temperature 0°C-40°C

Maximum humidity 80%

Class II

CE-Compliant approved by FDA





1.5 RoHS Certificate

CER	TIFI		E
1.7.0.7.75	TESTATION CEI		
10 million (1970)	F ELECTROMA		
		OLTAGE DIRECTIVES as been observed and audit has been	-
	completed succes	ssfully. c Compatibility Directive and	
		c Compatibility Directive and ken as references for these processes	
Company Name	: Dongguan Thunderlaser		
Company Address	: 109, Building 2, 159 Shatic city, Guangdong Provin	an Avenue, Shatian Town, Dongguan ce, China, 523980a	
Related Directives and Annex		Directive netic Compatibility Directive	
Related Standards	: EN IEC 61000-6-4:2019, El EN 61000-3-3:2013+A1:20 EN 60204-1:2018	N IEC 61000-3-2:2019 019, EN IEC 61000-6-2:2019	
Product Name	: Laser marking		
Report No and Date	: ZTL-2021121002S		
Product Brand/Model/Type	: THUNDERLASER//AURORA AURORA 32, AURORA 40	4 8, AURORA 16, AURORA 24,	
Certificate Number	: M.2021.206.C69897		
Initial Assessment Date	: 17.12.2021	Barol.	
Registration Date	: 20.12.2021	UDEM International Certification	i i
Reissue Date/No	:-	Auditing Training Centre Industry	Y
Expiry Date The validity of the certificate can be checked th can only be used under the responsibility of the Contomity for all the relevant Directives. This certific Auditing training Centre industry and Trade inc. I and the must keep a copy of this certificate fr only covers the product(s) stated above and UDB Address: Multilukent Mahailesi 2073 Soko Phone: +90 0312 443 03 90 Fax: +90 031 E-mail: info@udemitd.com.tr	e manufacturer with the completion of EC ate remains the property of UDEM Internation Co. to whom it must be returned upon req or 15 years from the registration of certificat 4 must be noticed in case of any changes of alk (Eski 93 Sokak) No:10 Çankaya – 2 443 03 76	c Declaration of onal Certification guest. The above to. This certificate on the product(s)	M

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1.6 Manufacturer's Label

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



It is recommended to record all of the data for access anywhere anytime. You will need to supply your Serial

Number to our Support Team on occasion.



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Chapter 2. Safety

2.1 General Safety Information

Any personnel involved in installation, set-up, operation, maintenance and repair of the machine, should have read and understood the Operation Manual, particularly for the "Safety" section. The user is recommended to assign specific company-internal personnel to implement each operation according to the qualifications the employees. And the receipt of the instruction/Operation Manual or the participation at introduction/training should be acknowledged in writing in each case.

Safety -conscious working

The machine must only be operated by trained and authorized personnel.

The scopes of different applicable operations of the machine must be clarified and observed in case of some problems related to safety. Especially for operations on the electric equipment, which must be performed by special experts only.

For all manipulations concerning modifications, maintenance, inspection and repair of installation, set-up, start-up, operation, conditions and operation methods, the switch-off procedures that may be provided in the Operation Manual must be observed.

Safety Information for the User and/or Operating Personnel



1. Any operating methods that will imperil the safety of the working machine are forbidden.

2. The operator must also ensure that no unauthorized person work with the machine (e.g. activating equipment without authorization).

3. It is the duty of the operator to check the machine before starting for externally-visible damage or flaws, and to report changes (including behavior during operation) that imperils the safety.

- 4. The user must ensure that the machine is only operated in sound condition.
- 5. The user must guarantee the cleanness and accessibility at and around the machine by corresponding instructions and controls.

6. No removing or interrupting safety components (we emphasize again the imminent dangers, for example severe burns, loss of eyesight, etc.). If the removal of safety components is required during repair and service, the replacement of the safety components must be performed immediately after repairing.

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7. Preparation, retooling, change of workpiece, maintenance and repair <u>must be performed only</u> with equipment switched off and by trained personnel.

8. Any attempt to perform unauthorized modifications and changes to the machine can **INVALIDATE THE WARRANTY.** This does not conform to Thunder Laser's routine preventive & general maintenance, adjustment and alignment, etc.

2.2 Laser Safety Information



 According to the assessment of the potential danger of the laser systems, the machine is classified into SECURITY CLASS 2. Thunder Laser AURORA series is a device of SECURITY CLASS 2, which is guaranteed by the protective housing and the safety installations.
 Attention: Improper operation and maintenance of the device can change the security level and cause the emission of harmful radiation.

2. Without safety precautions, exposure to laser radiation will cause the following risks:

Eyes: Corneal burn

Skin: Burns

Clothing: Danger of fire

3. Never try to modify or disassemble the laser or start up a modified or disassembled system!

4. Other inappropriate operation or adjustment will cause dangerous radiation exposure other than those described here.



2.3 Safety Precautions when Operating the Device

Your Thunder Laser AURORA SERIES has an integrated safety system which immediately stops running when

the protection cover (Lid) is opened. Opening the cover during the operation will interrupt the engraving.

Please remember the following safety precautions when working with this device:



1. CO2 Fire extinguishers should be placed near laser. Always keep a properly maintained and inspected fire extinguisher on hand.

2. Do not store any inflammable inside of the device. Particularly, leftovers of processed materials have to be removed to prevent fire hazard.

3. Please maintain free airflow around this system all the time. Do not cover the machine during operation.

4. Stay with the laser. Do not leave the laser unattended when it is working.



1. These lasers emit invisible radiation, so safety glasses should be worn when maintaining these machines for protection.

2. Adjustment of the beam path must be performed only by professionally trained personnel. Any non-standard setting can lead to uncontrollable emission of the laser radiation.



1. Do not disable limit switches or safety devices as this can invalidate warranties and cause damage to you and the machine.

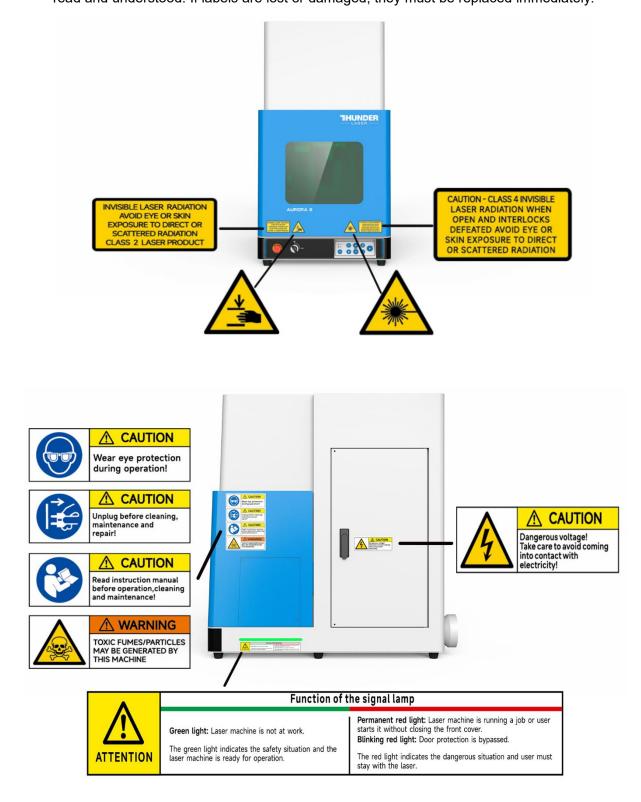
- 2. Before processing, please verify whether harmful materials can be generated and whether the equipment for exhaust and filtration is useful in dealing with the harmful materials. We need to emphasize that it is the responsibility of the user to consider the national and regional boundary value (the maximum permitted emission concentration) for dust, fogs and gases when selecting the system for exhaust and filtration.
- 3. Under no circumstances can PVC (polyvinyl chloride) be processed with the laser.



2.4 Warning and Information Labels



The warning and information labels in various locations of the machine should always be carefully read and understood. If labels are lost or damaged, they must be replaced immediately.

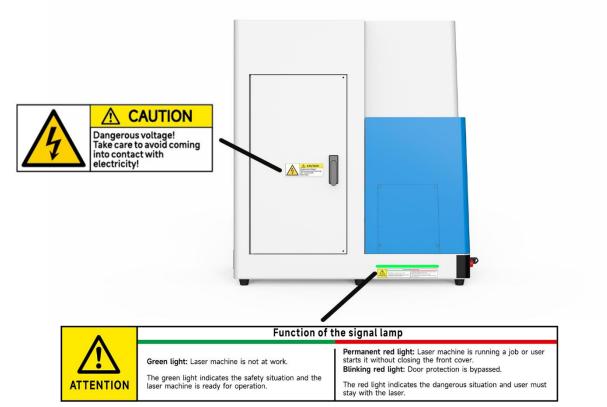


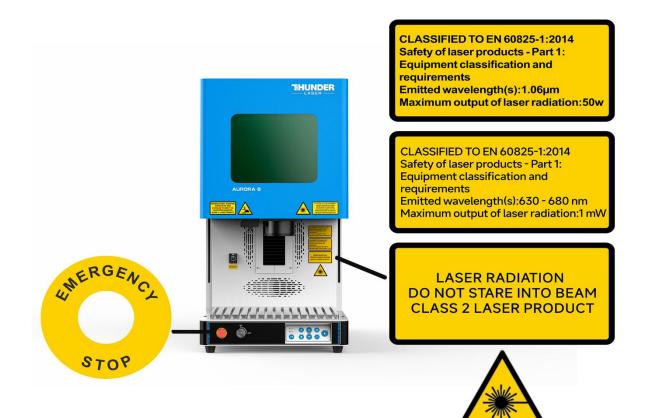
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Chapter 3. Process of Installing

3.1 Unpacking

When you receive your THUNDER LASER AURORA SERIES, it's packed in a wooden box which contains the laser machine and additional accessories. The steps for unpacking and assembling of the laser are as follows. Please follow them carefully.



Keep the packing box. You will need it in case of a return.

Dispose all waste according to the applicable waste disposal rules

1. Put the wooden box in a flat and spacious room for unpacking.

2. Remove the machine box; carefully remove the protective foam, wraps, films, etc.

3. Please keep the warranty certificate as well as the model and serial number of the machine. If you need tech support, please tell us these.

4. Then start to install the machine, carefully following the instructions in this manual.

3.2 Location

Before installing the fiber laser system, you should select an appropriate location. Follow the guidelines shown below:



1. Avoid locations of high temperature, much dust and high humidity. (The humidity should be kept within 70% and the recommended operating environment temperature range of the laser is 0-40°C.)

2. Avoid locations where the system is exposed to mechanical shocks.



- 1. Circuit Breaker protection: Do not connect other devices on the same circuit as that of the laser system. It requires a dedicated circuit.
- 2. DO NOT open any of the machine's access panels while the unit is plugged in. Opening any panel may expose the operator to severe electric shock, invisible laser radiation, mechanical pinch points, burns, blindness, and other hazards. POWER OFF AND UNPLUG after using!
- 3. DO NOT make or break any electrical connections to the system while the unit is turned on.



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1. Avoid locations with poor air circulation; select a location close to ventilation (if available). Select a location, whose room temperature is between 15 °C and 25°C (59°F - 77°F).

2. This is fundamental to maintain consistent and reliable operation of a fiber laser and the machine itself. Avoid higher ambient temperatures and strong exposure of the engraver to strong sunlight. Use blinds, if needed.

3. Mechanical shock and vibration of the laser will have detrimental effects on the performance and life expectancy of the machine. It will manifest (over a period of time) with a noticeable decrease in performance and need for maintenance, even breakdown, possibly. Setting your Thunder Fiber Laser up in s suitable controlled temperature, dust free, moisture free, level, stable surface (a level concrete floor) with the recommended maintenance method is critical to the ongoing performance of the machine. It is also a premise for warranty.



3.3 Connections



Perform the connections exactly in the order described; otherwise the static electricity can damage your computer and/or the electronics of the laser system.

3.3.1 Connecting the Mains

Connect one end of the mains cable with the connection socket at the rear side of the laser device (see figures

below) and the other end with a protected power outlet.

Mains voltage must correspond with the operating voltage (AC 110V~240V 50/60 Hz) – see information on label

beside the connection socket.



other.

Under no circumstances should you switch on the device if the voltages do not correspond with each



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3.3.2 Connecting the Computer

• AURORA 8

Connecting the computer and the machine by using the USB cable, as shown in the picture below:



About how to start to use software EzCad2, refer to chapter 5.1 EzCad2.



The USB cable is placed inside the toolbox.

3.3.3 Connecting the exhaust system

Insert one side of the gray exhaust pipe into the fan inlet and the other side into the machine behind the exhaust tank. Insert one side of the other gray exhaust pipe into the fan outlet and put the other side of the pipe outside the operation room (If the machine is too far from the door of the room to discharge the gas manufactured; then you might need a dust/fume filter, it can keep good air quality of your working environment). Please refer to the following pictures about how to install the exhaust pipe:

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The input voltage must correspond to the required range (AC 110V~240V 50/60 Hz) – see information label beside the connection socket.



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Chapter 4. Operation

4.1 Machine view

1. Left side door

On fiber laser, there are installed Z motor and Driver, Z limit switches. Please open this door for checking these parts, but you must pay attention to the electric current.

2. Rotary connector

Use to connect the rotary.

3. Camera

Using camera function.

4. Exhaust hole

This is for exhausting the fume.

5. Indicator light

If fiber laser machine is running, the signal lamp is in red light.

If the laser machine is on standby, the signal lamp is in green light.

6. Flap protection sensor

This is where the switch for flap protection exist. Laser will stop working once the cover is opened during working.

7. Emergency stop button

Once there's an accident during operation, please press this button immediately. And then the laser power and motion power will be cut off immediately.

8. Key switch

To turning the machine on.

9. Operate panel

Control auto-focus, galvo movement, etc.

10. F-lens

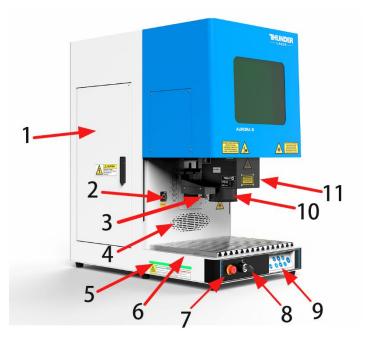
You can replace the field lens by rotating it.

11. Galvanometer

Composed of two parts: optical scanning device and servo control.

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12. Front door

Close it to run a file.

13. Protection glass

Protect eyes from laser reflection.

14. Pass-through door

User can remove it to marking some longer objects.



15. Cooling fan

Cooling the electricity parts.

16. Exhaust hose

Install the exhaust pipe.

17. PC connection port (USB)

This USB is for connecting computer.

18. Main power socket

To connect the main power.

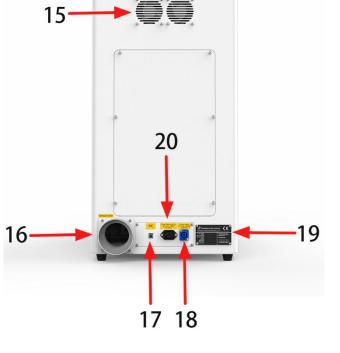
19. Manufacture's label

The device information is listed, such as serial number, manufacturing date and etc.

20. Exhaust fan socket

To connect the main power of exhaust fan.

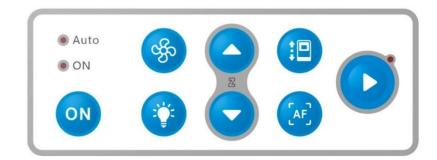
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4.2 How to use the display



Auto

• ON Auto and ON: Auto is red means that an automatic door is installed on the laser, otherwise not. On is red means the laser is ready, flashing means the laser needs to initialize. Auto and On are all off means the emergency is pressed.

ON

On button: Initialize button, user needs press this button after rebooting the machine.

cffo

Fan mode switching: In standard mode, the exhaust fan will always on. In auto mode, the fan will be on after marking.

Light button: Control the lighting of the work table, the light is divided into four brightness (the brightest by default for the power on).



Z button: Control the galvo to move.

:0

Door button: Control the front cover to open and close. For Aurora 8, this button is not working.



Auto focus button: Press it, the galvo will adjust the focal length automatically.



Start button: Press it to run the job.

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4.3 How to use the camera

There is a camera equipped with Aurora.

You can check the marking progress through the camera.



Open the camera app of your computer, and use the rear camera. User can check the work table when marking, like below.



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Chapter 5. Brief Introduction to Softwares

For AURORA 8 and AURORA 8 PRO, the software is different. Please note which one is what you need.

	AURORA 8	AURORA 8 PRO
Software	EzCad2	EzCad3

5.1 EzCad2

The EzCad2 software runs on a PC with 900 MHz CPU and 256 MB RAM at least. In general, we recommend the fastest PC available. EzCad2 was developed in Microsoft Windows XP and will run in Windows XP, WIN7, WIN10 and VISTA.

The installation of EzCad2 is very easy. Users just need to copy EzCad2 folder in the Install FOLDER to hard disk, and then double click the Ezcad2.exe under the EzCad2's directory to run the software.

If users run the software without connecting the fiber laser, a caution will appear and the software will work at demo state. In demo state, we can evaluate the software but we cannot save files and cannot control the laser device.



The Software, Drive and Correction file are in the U-disk that came with the fiber machine.

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5.1.1 Driver Installation

Turn on the fiber laser.

Connect your fiber laser with PC via USB cable.



Before moving on to the next step, please save the Driver file in the U- disk to your computer, and remember where it is.

• How to choose correct driver for fiber and uv laser.

Driver of fiber

« U盘拷贝资料-打标机切割机	AURORA Series- Fiber	r Laser → Fiber softw	vare → D	river →	
* 名称	^	修改日期	类型	믿	
4 LMCV4_RL_2020	0518	2021-04-16 17:42	文作	* 夹	
river of uv					7144
與贴版 AURORA Series-Fib	组织 er Laser → Fiber softv	ware > Driver	新建	で損	打廾 搜索"Driver"
5 ^ 名称	^	修改日期	明		类型
AA 2.0 (府 2.0 说明+: SZLI-B-L	V4A	2023-0)5-29 15	:15	文件夹

1. Go Manage>>Device manager>>Other devices>>USBLMCV2>>right click, Update driver>>Browse my

computer for driver software>>Browse, and find the CV4 folder you saved from the U-disk that came with the fiber laser>>Select the CV4 driver>>Next>>Install, then the driver is installed successfully. See pictures below.

	Open		
_	Pin to Quick access		
9	Manage		
1	Pin to Start		
с	Map network drive		
	Disconnect network drive		
	Create shortcut		
	Delete		
	Rename		
	Properties		

Pic1

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Computer Management	- 0 ×
Control of	
File Action View Help Computer Management (Local System Tools Computer Management (Local Computer Management (Local Computer Management Event Viewer Shared Folders Computer Management Storage Tisk Management Storage	Actions Device Manager More Actions
>	

Pic2

File Action View Help Þ 🔿 🔀 🖼 🔛 🛛 🖬 💭 🖳 🤽 🏵		
🖥 Computer Management (Local 🔽 🛃 DESKTOP-B0PM2	M2	Actions
 Wis System Tools Carta Tools Carta Scheduler Event Viewer Stared Folders Cartage Services and Applications Services and Applications Memory tech Memory tech Memory tech Memory tech Memory tech Memory tech Structure and other services of the service service service service services and the service servi	ices ers ace Devices I controllers nology devices er pointing devices ters device Update driver Disable device Uninstall device Scan for hardware changes Properties	Device Manager More Actions

Pic3

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→	Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.
\rightarrow	B <u>r</u> owse my computer for driver software Locate and install driver software manually,

Pic4

Brows	e for drivers on your o	computer			
Search f	or drivers in this location:				
C:\User	\laser\Desktop\Fiber laser\V	4 Driver\JCZDriverAllInOn	e ~	Browse	
✓ Inclui	le subfolders				
	et me pick from a list o				
	is list will show available driv me category as the device.	vers compatible with the o	ievice, and all i	anvers in the	

Pic5

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owse for drivers on your compu	ter		
arch for drivers in this location:			
\Users\laser\Desktop\Fiber laser\V4 Driver	×	B <u>r</u> owse	
Include subfolders			
Include subfolders			
Include subfolders			
→ Let me pick from a list of avai			
			1

Pic6

	×
Update Drivers - USBLMCV2	
Browse for drivers on your computer	
Search for drivers in this location:	
C:\Users\laser\Desktop\Fiber laser\V4 Driver	
Include subfolders	
→ Let me pick from a list of available drivers on my computer	
This list will show available drivers compatible with the device, and all drivers in the same category as the device.	
Next	4

Pic7

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	USER'S MANUAL	AURORA SERIES
📰 Windows Security		×
Would you like to install this device s Name: Beiling JCZ Co.,Ltd Publisher: Beiling JinChengZi Technology C		
Always trust software from "BeiJing JinCher Technology Co.,LTD".	ngZi Install Doi	n't Install
You should only install driver software from is safe to install?	publishers you trust. How can I decide which device	<u>ce software</u>

Pic8

		×
rk Control Board V2 [USB]		
ully updated your driv	rers	
ng the drivers for this device:		
Board V2 [USB]		
		Close
ssf allir		ssfully updated your drivers alling the drivers for this device:

Pic9

Then, you can open the software now.

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5.1.2 Software setting

1. General setting

• Fiber

Open the software, then press "F3" and select items according to the picture below (take AURORA 20W as an example).

Laser type: Fiber

PWM:

Max PWM: 60 kHz, Min PWM: 20 kHz. Fiber serial: IPG_YLP Open Mo Delay: 8ms.

Asser type C CO2 C YAG Fiber C SPI PWM P Enable PWM Signal Max PWM 60.0000 KHz Min PWM 20.0000 KHz	Q-Switch Use Digital Q-Switch driver GSwitch Open When FPK end FirstPulseKiller 40 us Fipulse width reverse Fiber	
Enable Tickle Pulse Width S.000 KHz Enable CO2 FPK	Serial IPG_YLP Open MO Delay 8 ms Laser Leak Handle Enable Poise Width	
FPK Start power 10.0 % FPK Increment power 10.0 %	Check state in marking SPI Wave 0 Continuous Simmer Cur 80.0 (0-100)%	Lase
Enable Erect analog output	nt Map	00 us

÷٣

The frequency ranges for different laser source.

UV laser	5W					
Fiber laser		20W	50W			
MOPA laser				20W	60W	100W
Frequency	20-150kHz	20-60kHz	50-100kHz	1-4000kHz		

And we set all setting above before leaving the factory, so just check if these are correct. If not, change them according.

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• UV

If your laser source is an uv 5w, please check according to below instruction.

Open the software, then press "F3" and select items according to the picture below Laser type: YAG

PWM:

Max PWM: 150 kHz, Min PWM: 20 kHz.

Laser type 2 C CO2 YAG C Fiber C SPI PWM F Enable PWM Signal 3		Q-Switch Use Digital Q-Switch driver QSwitch Open When FPK end			
Weinable PWM Signal Max PWM 150.000 Min PWM 20.0000	KHz	Power Map	FirstPulseKiller	40 us verse	
Pulse Width 1 Pulse freq 5.000 Finable CO2 FPK FPK Start power FPK Increment power	us KHz 10.0 10.0	%	SPI Wave 0	■ Continuous	
		Set	Simmer Cur 8	0.0 (0-100)%	Lase
Extend output					2264

2. How to import the calibration file



1. Before leaving the factory, we have done a correction test for each machine and imported the calibration file to fiber software, so the customer does not need to calibrate again.

2. Different field lenses have different calibrate files and cannot be used randomly.

3. If you've purchased other field lens with the fiber machine, we will prepare the calibration file and

put it in the U disk too.

4. If you've purchased other field lens after the machine left the factory, contact us to get the

calibration file.

Open the software>>Press "F3" button>>Field>>find the calibration file (say the name is110×110.cor) in the USB

disk that came with the machine. www.thunderlaser.com tech@thunderlaser.com Tel:(86) 18103043363

31 Roo

Laser Control Port Other HardInfo	After Mark Goto
ield Size 100.00 mm © Galvo1=X iffset X 0.000 mm © Galvo2=X iffset Y 0.000 mm mm ingle 0.000 Degree Degree	No Move Galvo Center Left Up Right Up
Vegate V	C Right Bottom C Left Bottom C Special pos.
Scale 100.0000 >> Scale 100.0000 >> 1.0000	Password Password

Customer can save the calibration file to computer from U-disk, and select it from computer.

5.2 EzCad3

The standard computer hardware required for the operation of EzCad3 software: dual-core CPU, memory 2G, hard disk 10G, dual native USB interface. The computer system software is Microsoft Windows operating system WIN7 64-bit, WIN8 64-bit and WIN10 64-bit. The default operating system of the manual is Microsoft Windows. Note: It is recommended to choose Professional or Enterprise Edition as the operating system.

EzCad3 software installation is very simple, users only need to copy the EzCad3 directory file on the installation CD directly to the hard disk. Then double-click the EzCad3.exe running software in the EzCad3 directory that has been installed. The computer must be authorized before the software runs, otherwise the software will not run normally.



	名称	~ 修改日期	类型	大小
	LANG	2021-06-22 14:43	文件夹	
	PARAM	2021-06-22 14:43	文件夹	
	PLUG	2021-01-23 14:42	文件夹	
	RES	2021-06-22 14:43	文件夹	
	AUTOSAVE.ez3	2021-05-31 10:53	EZ3 文件	12,284 KB
	CH365DLL64.dll	2015-06-15 17:29	应用程序扩展	25 KE
	DfjzhControlerDll64.dll	2016-08-12 18:27	应用程序扩展	871 KB
	dlc.dll	2021-04-21 22:43	应用程序扩展	459 KB
-	endpoint dll	2019-10-21 10.52	应用程序扩展	498 KF
L	🚴 Ezcad3.exe	2021-04-21 22:43	应用程序	1,772 KE
	Ezcad3_Multi.exe	2021-04-15 12:08	应用程序	1,741 KE
	Ezcad3Kernel.dll	2021-04-22 18:37	应用程序扩展	8,566 KE
	Ezcad3Motion.dll	2017-12-04 20:16	应用程序扩展	31 KE
	🗟 gt_rn.dll	2020-06-16 11:13	应用程序扩展	738 KE
	🧟 gts.dll	2020-06-12 15:13	应用程序扩展	1,738 KE
	🕒 LicenseManager_x64.exe	2021-01-19 19:45	应用程序	1,286 KE
	🖂 OpenIssue.exe	2019-11-07 17:30	应用程序	99 KE
	QIL.dll	2020-06-04 13:48	应用程序扩展	9,001 KE
	Scan3DLib.dll	2021-03-23 22:40	应用程序扩展	27 KE
ŧ.	WrapAlgorithm.dll	2020-11-01 21:41	应用程序扩展	888 KB



The Software, Drive and Calibration file are in the U-disk that came with the fiber machine.

5.2.1 Driver Installation

Turn on the fiber laser

1. Connect your fiber laser with PC via USB cable.

2. Before moving on to next step, please save the Driver file in the U-disk to your computer, and remember where

it is.

↑ 📙 «	AUR	ORA Series- Fiber La	aser > Fiber software	> Driver	~	ō	
5	^	名称	^	修改日期	类	型	大小
ive Cloud Fi	ik	DLC Driver		2021-06-23 11:20	文	件夹	

3. Go Manage>>Device manager>>Other devices>>DLC1000>>right click, Update driver>>Browse my computer for driver software>>Browse, and find the DLC1000 folder you saved from the U-disk that came with the fiber laser>>Select the DLC1000 driver>>Next>>Install, then the driver is installed successfully. See below pictures.

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	Pin to Quick access	
9	Manage	
	Pin to Start	
	Map network drive	
	Disconnect network drive	
	Create shortcut	
	Delete	
	Rename	
	Properties	

Pic1

File Action View Help		
Þ 🔿 🚾 🖾 🛛 🖬 🖬 💷 💭 🖳 🖊 🕗		
Computer Management (Local 🗸 📇 DESKTOP-B0PM2M2	Actions	
System Tools June 201 System Tools Supervised and outputs	Device Manager	
Solution (Construction) Construction (Construction)	More Actions	
> 👔 Shared Folders > 🚯 Bluetooth > 🔊 Local Users and Groups > 💿 Cameras		
> N Performance > Computer		
Device Manager		
Storage S		
> 🥅 Keyboards		
> Memory technology devices		
> III Mice and other pointing devices > Monitors		
> 🚽 Network adapters		
✓ ♥ Other devices		
DLC10000		
Inknown device		
> 🚍 Print queues		
> Processors		
Security devices Software devices		
> 🔰 Sound, video and game controll	ers	
> 🍇 Storage controllers		
> 🏣 System devices		
> 🏺 Universal Serial Bus controllers		
>		

Pic2

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AURORA SERIES

🚂 Computer Management		– 🗆 X
File Action View Help		
🔶 🧆 🙇 📊 🛅 🔽 📊	📃 💺 🗙 🖲	
Computer Management (Local System Tools Task Scheduler Task	 DESKTOP-B0PM2M2 Audio inputs and outputs Batteries Biometric devices Bluetooth Cameras Computer Disk drives Disk drives M Human Interface Devices M LDE ATA/ATAPI controllers 	Actions Device Manager More Actions
	 Keyboards Memory technology devices Mice and other pointing devices Monitors Motors Network adapters Other devices DLC1000 Update driver Update driver Unkno Improcessors Uninstall device Software d Scan for hardware changes Sound, vid Properties 	
< >> Launches the Update Driver Wizard fo	 See Storage co. To System devices If Universal Serial Bus controllers 	

Pic3

 → Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings. → Browse my computer for driver software Locate and install driver software manually. 	All = 24						
	Window for your	s will search you device, unless y	r computer and	the Internet for th	e latest driver s	oftware tion	

Pic4

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	×
🗲 📲 Update Drivers - DLC10000	
Browse for drivers on your computer	
Search for drivers in this location:	
C:\Users\laser\Documents	
✓ Include subfolders	
→ Let me pick from a list of available drivers on my computer	
This list will show available drivers compatible with the device, and all drivers in the same category as the device.	B
Next	Cancel

Pic5

Browse for drivers on you	ir computer			
Search for drivers in this location:				
C:\Users\laser\Desktop\DLC Driv	er	~ [B <u>r</u> owse	
✓ Include subfolders				
→ Let me pick from a lit This list will show available				
same category as the devic				

Pic6

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Browse for drivers on your computer	
Search for drivers in this location:	
C:\Users\laser\Desktop\DLC Driver	→ B <u>r</u> owse
☐ Include subfolders	
\rightarrow Let me pick from a list of available	
This list will show available drivers compatible same category as the device.	and a second second of the second second

Pic7

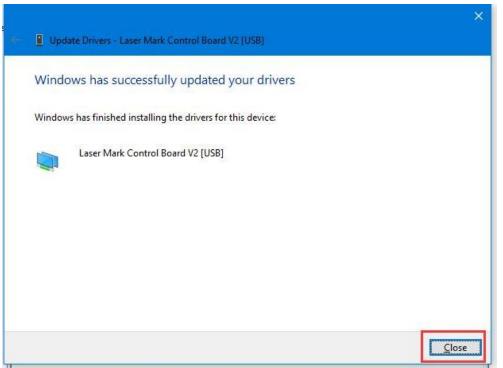
	×
Update Drivers - Laser Mark Control Board : DLC Version 1	
Windows has successfully updated your drivers	
Windows has finished installing the drivers for this device:	
Laser Mark Control Board : DLC Version 1	
Close	7

Pic8

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Pic9

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5.2.2 Activate the software

EzCad 3 needs to be activated before initial use.

• Activating process

The activation code is inside the text file.



You can find it in the U disk that come with the machine.

The dongle that came with the machine, with a string of activation codes on the back side. It's already inserted into the machine, as shown below:



Don't unplug it!

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IUN®ER

The activation code can only activate 5 computers!!!

- 1. Find the activation code and copy it.
- 2. Open the activated software LicenseManager X64 in fiber software folder.

File Home Share	View Application Tools		~ (
🛧 📘 > Ez	cad3_Release	ٽ ~	
▶ Quick access ■ Desktop ★ ● Downloads ★ ■ Documents ★ ■ Pictures ★ ■ This PC ★ ■ This PC ★ ■ Documents ★ ■ Dobjects ★ ■ Desktop ★ ■ Documents ↓ ↓ Downloads ↓ ↓ Downloads ↓ ↓ drive (192.168.1.; ↓	Name RES AUTOSAVE.ez3 CH365DLL64.dll DfjzhControlerDll64.dll dlc.dll endpoint.dll Ezcad3.exe E	Date modified 2021/6/22 14:56 2021/5/31 10:53 2015/6/15 17:29 2016/8/12 18:27 2021/4/21 22:43 2019/10/21 10:52 2021/4/21 22:43 2021/4/21 22:43 2021/4/21 22:43 2021/4/21 22:43 2021/4/21 22:43 2021/4/21 22:43 2021/4/21 20:16 2021/4/21 10:52 2021/4/21 20:16 2021/4/21 10:52 2021/4/21 20:16 2020/6/16 11:13 2020/6/12 15:13 2021/1/19 19:45 2019/11/7 17:30	Type Size File folder EZ3 File Application exten Application exten Application exten Application exten Application exten Application Application exten Application Application exten Application Application exten Application exten Application exten Application exten Application exten Application exten Application exten Application exten
Music Pictures Videos	Image: Construction of the second	2020/6/4 13:48 2021/3/23 22:40 2020/11/1 21:41	Application exten Application exten Application exten



3. Click License activation icon

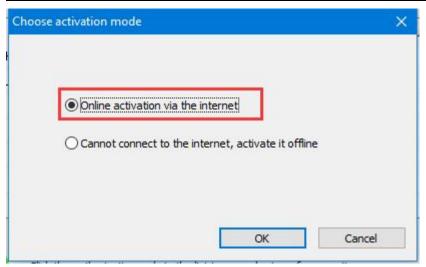
Expiration	Status	Attribute

4. Click "online activation via the internet" and click "ok"

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40 R





5. Click "Get the activation request file" and enter the activation code that you record. Then click "OK".

SN	Choose the operation mode re
	Get the activation request file Get the activation code file using the request file
	Apply activation code file Get it via Bit Platform
	Back Cancel



	×	e	×
		e	
BLTT3OA4QXW5JL4			
	OK Car	OK Cancel	OK Cancel

6. Then it will show "Activate SN successfully".

nt Tool Product	- 🗆 🗙
	Unidentified BitID (1)
Choose activation mode	Jte
 Online a Cannot Cannot OK 	
Click the authorization code in the list to upgrade, transfer operation	
	Choose activation mode

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7. Now, the SN is activated successfully.

SN	Expiration	Status	Attribute
4BLT **** 5JL4			

8. Then you can open the EzCad3 software.

5.2.3 Software setting

1. General setting

We have made the correct settings in the software before the machine leaves the factory.

Please open the software to check if they are correct.

Open the software, then press "F3" and select items according to the picture below (take MOPA 20W as an example).

Laser type: FIBER

Frequency(kHz):

Min Value:1, Max Value:4000.

FIBER:

Type: IPG_YLPM(Type:D)

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Configuration H:\打标机U盘资料\20220409\英文\AURORA 8 PRO\Fiber software\Ezcad3\PARA.... 💷 💷 🔀

- Field	🗉 Laser type		
Laser Control	Laser type	FIBER	
Port	Frequency(kHz)		
Stop marking port Red light pointer	Min Value	1	
Fly Mark	Max Value	4000	
Scanner	Frequency Delay(ms)	0	
Axis solution	PWM Opening delay(us)	0	
Hardware info Password	Power		1
Other	Power Map	0-0.0%,100-100.0%	
ould			
	• YAG		
	🗆 FIBER		
	Туре	IPG_YLPM(Type:D)	
	Pulse Width		
	Enable pulse width setting	True	
	Enable the first time to open the	False	
	Changing pulse duration delay(10	
	Pulse width index mode	False	
			_



The frequency ranges for different laser source.

UV laser	5W					
Fiber laser		20W	50W			
MOPA laser				20W	60W	100w
Frequency	20-150kHz	20-60kHz	50-100kHz		1-4000kHz	

2. How to import the correction file.



1. Before leaving the factory, we have done a correction test for each machine and imported the calibration file to fiber software, so the customer does not need to calibrate again.

2. Different field lenses have different calibrate files and cannot be used randomly.

3. If you've purchased other field lens with the fiber machine, we will prepare the calibration file and

put it in the U disk too.

4. If you've purchased other field lens after the machine left the factory, contact us to get the calibration file.

Open the software>>Press "F3" button>>Field>>find the calibration file (let's say the name is 9×9.cor) in the USB disk that came with the machine.

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_	Y	
D	44	Roon

USER'S MANUAL AURORA SE		HUNDER
e\PARAM\MarkCfg7	Laser\Desktop\Ezcad3_Release\PA	figuration C:\Users\Thunder La
217.727	 Field Size(MM) 	Field Laser Control Port
True False	Galvo2=X Reverse X	Stop marking port Red light pointer
False	Reverse Y	Fly Mark Scanner
True	Use the correction file	Axis solution Hardware info
F:\9X9.cor	File name	Password 1
	🗉 Transform	ouler 1
0	Offset X(MM)	
0	Offset Y(MM)	
0	Offset Z(MM)	
0	Angle(Degree)	
	🗉 Go to pos. after Mark	
False	Enable	
0	Position X	
0	Position Y	
· · · · · · · · · · · · · · · · · · ·	😑 Limit param	
	File name	
2 OK Cancel	riie name	

Chapter 6. How to set & adjust the focus length of Auto-focus

AURORA series marking machines can be equipped with 3 field lenses (F-160, F-210, F-290), UV laser is equipped with 3 field lenses (F-160, F-210, F-290), and the focal lengths of different field lenses are different. After changing the field lens, the user needs to adjust the focus of autofocus again.

• How to set the focus length of Auto-focus

- 1. Connect machine and computer with the USB cable.
- 2. Install USB driver: Right click "computer">>Management>>device manager>>Other devices>>USB

Serial>>Update Driver>>Browse my computer to driver software>>Find the Driver folder that came with the

machine CD340G-USB-Drive>>Next>>Install successfully.

Find the corresponding COM of the USB, and remember it.



The auto-focus software driver folder is in the U-disk that came with the Fiber machine.

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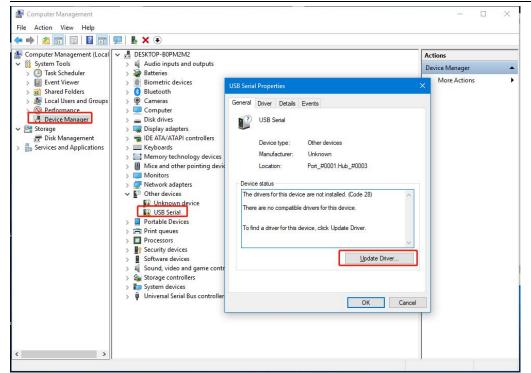
45

DONGGUAN THUNDER LASER EQUIPMENT CO., LTD Room1101, Building 3, No. 68, Xingzhou Road, Shatian Town, Dongguan City, Guangdong Province, China

ES



AURORA SERIES



Pic1

	Search automatically for updated driver software
	Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.
\rightarrow	Browse my computer for driver software Locate and install driver software manually.

Pic2

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μ.



Update Drivers - USB Serial Browse for drivers on your computer	r
Search for drivers in this location: F:\Jhc Auto Focus\CH340G_USB Drive Include subfolders	✓ B <u>r</u> owse
→ Let me pick from a list of availab This list will show available drivers compat same category as the device.	
	Next Cancel

Pic3

		×
*	Update Drivers - USB-SERIAL CH340 (COM10)	
	Windows has successfully updated your drivers	
	Windows has finished installing the drivers for this device:	
	USB-SERIAL CH340	
	Close	
4		

Pic4

4. Choose correct COM port and click connect, then set the screw pitch as 5, Pulse count as 5000. Speed as 2(divided into 9 gears, 1 fastest, 9 slowest, 1-9 speed decreasing), then click "Send", the window of "successfully set" will be presented. And input the focal length according to the reference form.

Focal Length for different lens (for reference only)

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	R ER	USI	ER'S MANUA	AURORA SERIES		
	F-160	F-210	F-290	F-160(UV)	F-210(UV)	F-290(UV)
AURORA 8			P:30%, S:100mm/s,			
Focus length range	218.14~219.52mm	304.71~308.17mm	398.03~401.08mm	1	/	1
AURORA 8(UV5W)		F:5	0kHz, S:100mm/s, PW	:1µs		
Focus length range		1		231.94~236.88mm	289.98~295.19mm	374.16~377.94mm
AURORA 8 PRO		P:30	0%, S:100mm/s, PW:10	DOns		
Focus length range	220.56~222.64mm	303.84~306.56mm	395.52~397.1mm	1	1	
	🦂 Thunder Laser Autofocus Setting 🛛 🗙					
	○中文	English				

中文 · English	
Connection	
Port: COM4	~
Baud rate: 115200	~
Disconnec	t
Gear pitch: 5	mm
Pulse: 5000	 Circle
	_
Focal length: 214.57	mm
Focal length: 214.57 Speed: 2	•
	▼ mm

• How to adjust the focus length

1. Install the USB driver first, and set the Screw pitch, Pulse count and Speed according to the steps in the last part **How to set the focus length**.

2. Open the marking software, place a piece of metal material on the working platform, draw a 10*10mm square in the software, set the marking parameters. It is recommended to set the speed to 100mm/s and the power to 30%. Low-speed marking makes it easier to observe changes in focal length. Click on the red light, align the material, and click on the mark. During the marking process, press the up or down button of the marking machine to observe the beam. When the beam is at its brightest, the focus length is optimum. At the same time, it can be observed that the actual focal length column in the auto-focus adjustment software is constantly changing. Please record the actual focal length when the beam is at its brightest. About how to use the Fiber laser, you can refer to

Chapter 7.

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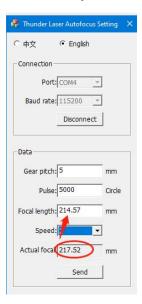


AURORA SERIES

And the table below is for reference. You can input them in auto-focus software or adjust based on them.

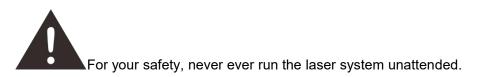
	F-160	F-210	F-290	F-160(UV)	F-210(UV)	F-290(UV)	
AURORA 8		P:30%, S:100mm/s,					
Focus length range	218.14~219.52mm	304.71~308.17mm	398.03~401.08mm	1	1	1	
AURORA 8(UV5W)		F:5	0kHz, S:100mm/s, PW	:1µs			
Focus length range		/ 231.94~236.88mm 289.98~295.19mm					
AURORA 8 PRO							
Focus length range	220.56~222.64mm	303.84~306.56mm	395.52~397.1mm	1	1		

3. Input the recorded real focal length value into the input box of setting focal length, click "send" again, the software will return to the successful setting, the parameters will be stored by the software, and the system will automatically move to this position by clicking the auto-focus button again.



Chapter 7 The First Time to Run the Fiber Laser

7.1 The first time to run a fiber laser



Your first marking test (take AURORA 8 PRO, MOPA 20W, Lens F-290 as an example)

The following steps describe how to successfully engrave a pattern for the first time. Please follow the steps:

1. First ensure that the exhaust fan, computer and all mains are connected.

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2. Turn on the key switch and emergency button.



3. Press"ON"

button to initialize the machine.

3. Place the material on the working platform.



4. Open the software EzCad3, then install driver and import the calibration file according to Chapter

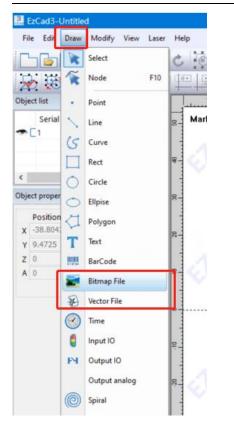
5.2.3.

Please must follow the steps to turn on the machine:

Turn on the machine>> turn on the software, otherwise the software cannot connect with the machine.

5. Import your file to EzCad3







This software supports these file types.

Vector Files

Files of type:	All vector Files(*.ai;*.plt;*.dxf;*.dst;*.svg;*.nc;*.g; ~	Cancel
	All vector Files(*.ai; *.plt; *.dxf; *.dst; *.svg; *.nc; *.g; *.elc; *.gbr Ai Files(*.ai)	;*.bot,*.bin,*.igs
	HPGL Files (*.plt)	
	DXF Files (*.dxf)	
	Jcz Point cloud Files (* jpc)	
	Svg Files (*.svg)	
	Gerber Files (*.gbr,*.bot) G Code Files (*.nc,*.g)	
	Electrox Files (*.elc)	
	MatJob Files (*.bin)	
	Igs Files (*.igs)	
	TAJIMA Dst Files(*.dst)	

Image Files

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D

M

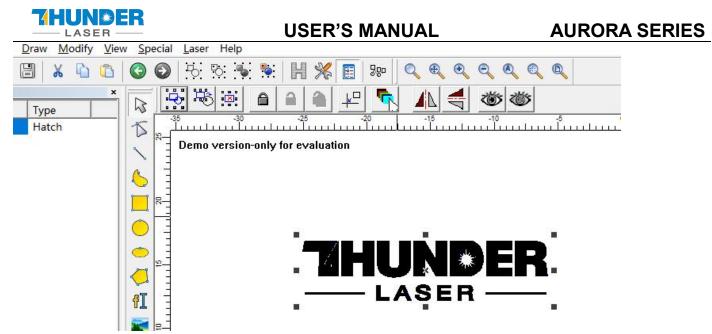


Files of type:	All Image Files (*.bmp;*.jpg;*.jpeg;*.gif;*.tga;*.pn 🗸	ncel
	All Image Files (*.bmp; *.jpg; *.jpeg; *.gif; *.tga; *.png; *.tif; *.tiff) Bmp Files (*.bmp) Jpg Files (*.jpg) Jpeg Files (*.jpg) Gif Files(*.gif) Tga (*.tga) Png (*.png) Tif (*.tif) Tiff (*.tiff)	
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6. Press "Hatch", choose Hatch1(or you can choose the others as you need), set the Line space as 0.05mm (we recommend the range of 0.01-0.1mm), then press "OK".

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	End Offset	0	ММ	
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	NumLoops	0		
	Loop distance	0.5	MM	
	Auto rotate h	hatch angle		
		10	Degre	

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7. Set the marking parameters for your file. Adjust parameters as needed (you need to unselect "use the default para" for changing the parameters).

Set the Loop Count to 1, Speed to 1800mm/s, Power to 50%, and Frequency to 300KHz, Pulse width to 200ns.

Start TC(US) to 150, Laser Off TC(US) to140, End TC(US) to 300, Polygon TC(US) to 100.

Other settings needn't to change.



For different watts, the frequency range is different, please refer to the table below.

UV laser	5W					
Fiber laser		20W	50W			
MOPA laser				20W	60W	100W
Frequency	20-150kHz	20-60kHz	50-100kHz		1-4000kHz	



	Current pen parameter						
	Pen No.	0					
	Use default param	False					
	Param name	Default					
	Marking parameter						
	Loop Count	1					
	Speed(MM/Second)	1800					
	Laser param[FIBER]						
Frequency(KHz Power(%)	Frequency(KHz)	300					
	Power(%)	50					
	Pulse Width	200ns					
	Delay Param						
	Start TC(US)	150					
	Laser Off TC(US)	140					
	Polygon TC(US)	100					
	End TC(US)	300					
	Jump param						
	Jump Speed(MM/Second)	2000					
	Min jump TC(US)	10					
	Max jump TC(US)	85					
	Jump limit(MM)	10					

8. You can see a red dot on the work area, which comes from the galvanometer. So please put your material under the red dot, then press the "Auto focus" button. The galvanometer will adjust the focus distance automatically, which will last for 2-3 seconds. After hearing a beep (from the indicates light), the focus distance adjustment is complete.



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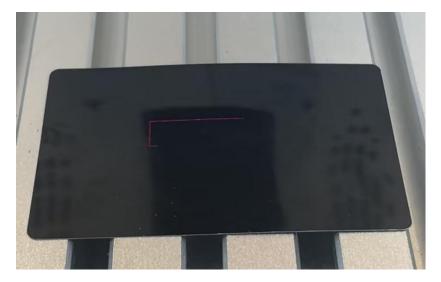


9. Press Key F1 or Red(F1) in software, then fiber will virtually mark out the size of your file. Adjust the position of your material according to the red area. See pictures below.

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			USE	R'S MAN	IUAL		AURORA SERIES
Mark					25		▲ ₫ X
☐ Continuous ☑ Mark Select ☐ Multilayer	Part 0 Total 0	R	00:00:00.000 T 00:00:00.000 Show contour	Red(F1)	Mark(F2)	Rara(F3)	



10. Close the door and press Key F2 or Mark(F2) in software. Or press "start" button to mark.

Mark							21	▼ ↓ ×
□ Continuous ☑ Mark Select □ Multilayer	Part 0 Total 0	R	00:00:00.000 00:00:00.000	T	Red(F1)	Mark(F2)	Rara(F3)	



1. The controller can record the last file, if you want to run a file twice or more, you can just press "Start" button of the fiber machine.

2. You can start to mark with "Start" button also.

11. The fiber laser will mark your image.



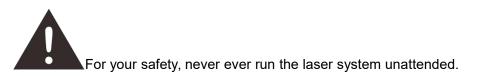


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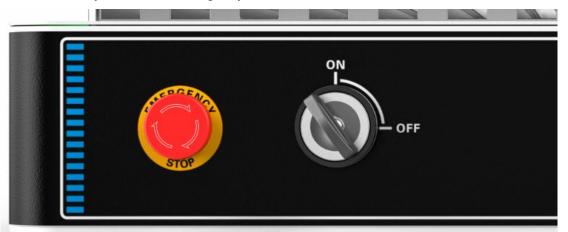
7.2 The first time to run a UV laser



Your first marking test (AURORA 8, Lens F-170)

The following steps describe how to successfully engrave a pattern for the first time. Please follow the steps:

- 1. First ensure that the exhaust fan, computer and all mains are connected.
- 2. Turn on the key switch and emergency button.



3. Place the material on the working platform.



4. Open the software EzCad2, then install driver and import the calibration file according to Chapter 5.2

Please must follow the steps to turn on the machine:

Turn on the machine>> turn on the software, otherwise the software cannot connect with the machine.

5. Import your file to EzCad2

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File	Edit	Draw	Modify	View	Laser	Help			
	New\t	tCtrl+N							
	Open.	\tCtrl+	-0						
	Save\	tCtrl+S							
	Save /	As							
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	Import Bitmap File\tCtrl+W								
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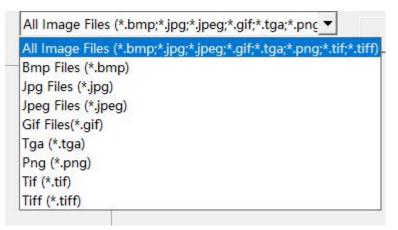
<u>-</u>)):

This software supports these file types.

Vector Files

All ve	ctor Files(*.ai;*.plt;*.dxf;*.dst;*.svg;*.nc;*.g;*gb
Ai File	es(*.ai)
HPGI	Files (*.plt)
DXF	Files (*.dxf)
Jcz P	oint cloud Files (*.jpc)
svg F	iles (*.svg)
G Co	de Files (*.nc,*g,*gbr)
Gerb	er bot Files (*.bot,*.gbr)
TAJIN	A Dst Files(*.dst)

Image Files



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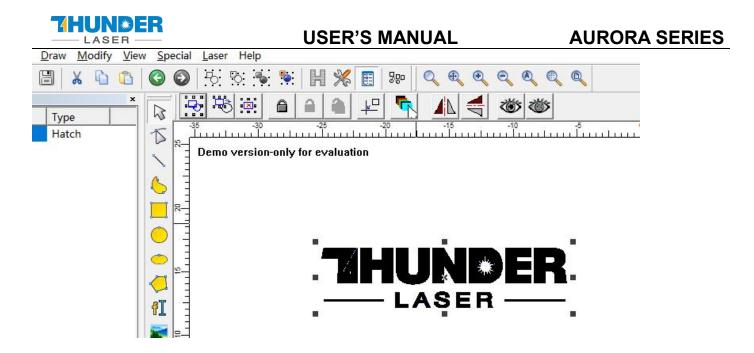
6. Press "Hatch", choose Hatch1(or you can choose the others as you need), set the Line space as 0.025mm (we recommend the range of 0.01-0.1mm), then press "OK".

Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state Image: Second state		
2	Hatch Mark Contour Hatch1 2 3 Felable Type All calc Follow edge on Cross hatch Angle Pen No. Count 1 Line Space 0.025 MM Average distribute line Edge Offset 0 MM Start Offset 0 MM Linereduction 0 MM Linereduction 0 MM Linereduction 0 MM Auto rorate hatch: 10 Degree	3 OK Cancel Undo Hatch T Hatch one by one

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7. Set the marking parameters for your file. Adjust parameters as needed (you need to unselect "use the default para" for changing the parameters).

Set the Loop Count to 1, Speed to 1200mm/s, Frequency to 50KHz, Q-Pulse width to 5µs.

Start TC(US) to 0, Laser Off TC(US) to120, End TC(US) to 100, Polygon TC(US) to 100.

Other settings needn't to change.



For uv laser source, the Q-pulse different watts, the frequency range is different, please refer to the

table below.

F(kHz)	20	30	40	50	60	70	80	90	100	110	120	130	140	150
PW(µs)	<50	<33.33	<25	<20	<16.67	<14.29	<12.5	<11.11	<10	<9.09	<8.33	<7.69	<7.14	<6.67



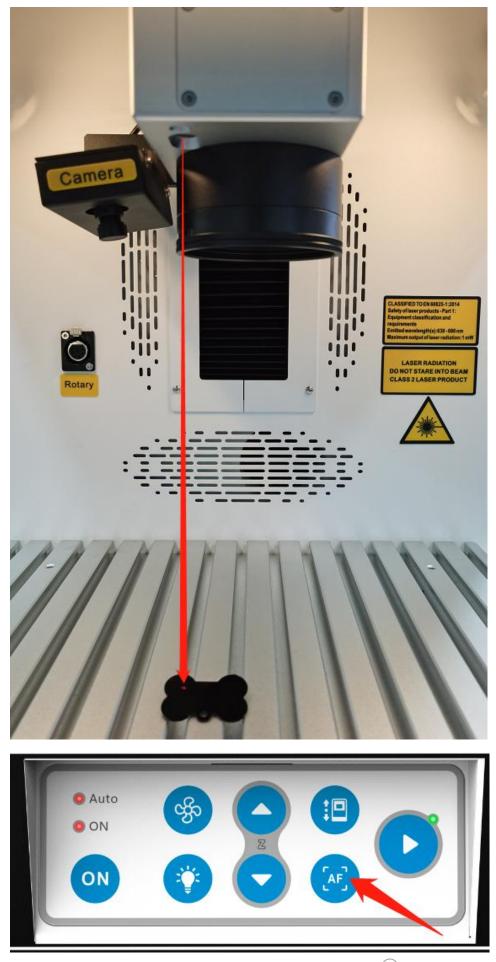
Current pen 0 Loop Count 1 Speed(MM/Second 1200 Current(A) 1 Frequency(KHz) 50 Q Pulse Width(U 5 Start TC(US) 0 Laser Off TC(US 120 Send TC(US) 100	1º	1.41
Speed (MM/Second1200Current (A)1Frequency (KHz)50Q Pulse Width (U5Start TC (US)0Laser Off TC (US)120End TC (US)100	1	
Current(A) 1 Frequency(KHz) 50 Q Pulse Width(U 5 Start TC(US) 0 Laser Off TC(US 120 End TC(US) 100		
Frequency(KHz) 50 Pulse Width(U 5 Start TC(US) 0 Laser Off TC(US) 120 End TC(US) 100	1200	(-(A) (-(V)
Pulse Width(U 5 Start TC(US) 0 Laser Off TC(US 120 End TC(US) 100	1	
Start TC (US) 0 .aser Off TC (US) 120 .and TC (US) 100	50	((A) ((t)
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8. You can see a red dot on the work area, which comes from the galvanometer. So please put your material under the red dot, then press the "Auto focus" button. The galvanometer will adjust the focus distance automatically, which will last for 2-3 seconds. After hearing a beep (from the indicates light), the focus distance adjustment is complete.

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9. Press Key F1 or Red(F1) in software, then fiber will virtually mark out the size of your file. Adjust the position of

your material according to the red area. See pictures below.



10. Close the door and press Key F2 or Mark(F2) in software. Or press "start" button to mark.

Mark								▼ ∓ X
□ Continuous ☑ Mark Select □ Multilayer	Part 0 Total 0	R	00:00:00.000 00:00:00.000	T	Red(F1)	(a) Mark(F2)	Rara(F3)	



1. The controller can record the last file, if you want to run a file twice or more, you can just press

"Start" button of the fiber machine.

2. You can start to mark with "Start" button also.

11. The laser will mark your image.





Chapter 8 Maintenance

8.1 General Maintenance

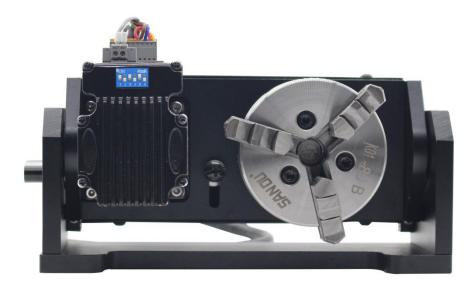
Caution-Before any maintenance efforts takes place, ensure that the power supply has been cut off and the system is powered off.

All maintenance efforts must be carried out according to the safety regulations.

In order to ensure the maximum availability and lifespan of the system, we recommend that you regularly check the ventilation and keep the surrounding area clean.

• Lubricating the rotary

It is suggested to add lubricant oil (or Rust Preventative Grease) to the chuck at least every two weeks.



8.2 Clean the Field lens

This system is equipped with high-quality optical components, which, under normal operating conditions, are free for maintenance within their lifespan. However, it may be necessary to clean output lenses, e.g. the scanner flat field lens (f-theta objective) needs cleaning if it is covered in dust or fumes.

- 1. Never touch the optical components with your fingers! Oily or dirty hands may damage the surfaces of lens.
- 2. Do not use any tools or hard objects to clean the surfaces. Scratches cannot be repaired.
- 3. Blow away large pieces of dirt by blowing up a balloon.

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4. Spray the cleaning solution onto the Q-tip, and remove the remaining stains with it.



5. Distribute the cleaning fluid carefully by small circular motions. Start with the center of the lens and move outwards to the edge. Keep moving the Q-tip until the entire surface is clean.

- 6. Clean it again with a new clean and dry cotton swab.
- 7. Make sure that no water or stains remain on the surface of the lens after cleaning.
- 8. Do not wipe the lens with a dry cloth.
- 9. Do not exert any pressure on the lens.
- 10. Clean once half a year (depended on the usage).

The End.

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