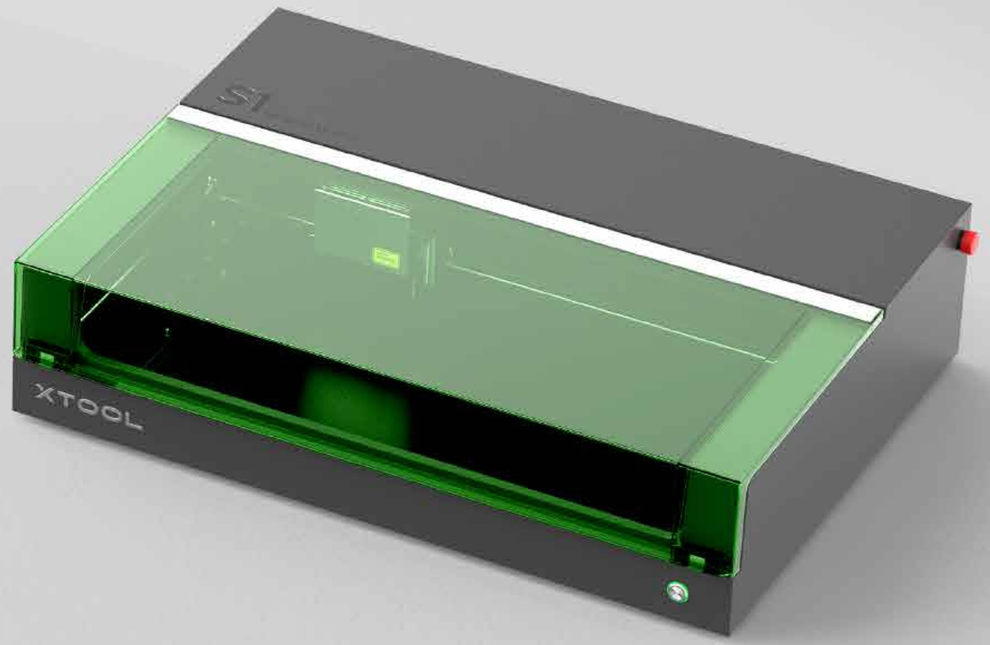
XTOOL | S1

User Manual



XTOOL

D1.1.4_KD010637000

THANK YOU!

Dear xTooler:

Thank you for choosing xTool S1. We are so grateful for your recognition, and sincerely hope you will enjoy it!

xTool S1 is an easy-to-use powerful laser cutter and engraver with high processing speed and accuracy, supporting accurate coordinates-based positioning, automatic focus, and curved surface engraving. Whether you are a novice or an expert, whether you use it at home or for business purposes, xTool S1 is ready to give you the best laser engraving & cutting experience.

Our mission is to make it easier for everyone to create with our machine. We attach great importance to product experience and user suggestions. Please let us know if you have any questions anytime. We are always here to help. You can join our Facebook group to share creative ideas and get inspired by others.

By visiting our online store, you can also find our latest accessories and various materials to maximize the magic of xTool S1.

Thanks again for your support, and we will consistently provide quality products and services in the future.

Sincerely,



CEO

Official website: xtool.com
Facebook group: xTool S1 Official Group
Support center: support.xtool.com
Technical support: support@xtool.com
Video tutorial: youtube.com/c/xToollaserbox?sub_confirmation=1

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Safety first (important)

1. General safety

Read and get familiar with all safety precautions and procedures before using the machine. Strictly follow all safety precautions. Ensure that the machine is properly assembled and is working properly.

Caution

Follow the operating principles:

- Check the machine for damage every time before you use it. Do not operate it in any way when any damage or defect is found.
- Ensure that the workspace is clean and flat.
- Do not disassemble the machine or change its structure in any way without authorization. Do not modify or decompile its operating system.
- Do not leave the device unattended during operation. Pay attention to whether it is working properly.
- Keep the inside of the machine clean. Residues and chippings accumulated during cutting and engraving are dangerous and may cause a fire. Clean the chippings and residues inside the work area regularly.
- The machine works properly at the temperature of 0°C to +35°C and can be stored properly at the temperature of –10°C to +40°C. Do not operate it at a temperature lower than 0°C.

2. Laser safety

Generally, the laser module is completely enclosed in the casing and light shield during operation. The device has a safety interlock switch. If the lid is lifted during operation, the device will stop working and no harm will be done to people.

Warning

Follow the operating principles:

- Do not operate the machine when any part of it is removed. Removing any part may expose the laser system and cause damage to the machine.
- Do not engrave or cut any material that contains PVC or vinyl (processing plastics is not recommended). These materials (and other materials containing chlorine/chloride) can generate corrosive vapor that is extremely harmful to the human body and can cause damage to the device. Any damage caused by engraving or cutting any material containing PVC or vinyl is not covered by the Company's warranty.
- Do not engrave or cut any unknown materials. Vaporization or melting of many materials, which include but are not limited to PVC and polycarbonate, may release harmful smoke.
- Laser operation is prohibited when the lid is lifted. Make sure that the lid is closed during operation and do not tamper with the safety mechanism of the lid.
- Do not leave the device unattended during operation. Pay attention to whether it is working properly.

The reference standards for laser safety are the American National Standard for Safe Use of Lasers (Z136.1-2022), International Electrotechnical Commission Standard (IEC 60825-1:2014), and European Standards (EN 60825-1:2014/A11:2021).

3. Fire safety

Do not leave the device unattended when it is working.

Keep combustible materials away from the device.

A high-density laser beam is used by the device to irradiate the material to be cut or engraved, so as to heat up the material surface and vaporize the material without burning. But most materials are inherently flammable and may be ignited to form an open flame that can burn down the device (even if it is made of flame-retardant materials) and its surroundings. Experience shows that vector cutting with a laser is most likely to produce an open flame. In particular, acrylic has proven to be extremely flammable in vector cutting.

Danger

Read the following warnings and suggestions carefully:

- Ensure that the workspace is well-ventilated so that the generated smoke can be discharged in time.
- Do not stack materials (especially organic ones, such as paper) around the machine. They may cause the spread of flames and increase the risk of material ignition.
- Do not leave the machine unattended when it is working. If the machine works with setting errors and is left unattended for a long period of time, or if a mechanical or electrical fault occurs, a fire may be caused.
- Clean the device regularly. Excessive accumulation of residues and chippings from cutting and engraving would increase the risk of fire. The internal working area needs to be cleaned periodically to ensure that there is no residue or chipping inside the device.
- Ensure that the area around the machine is clean without any cluttered flammable materials, explosives, or volatile solvents, such as acetone, alcohol, or gasoline.
- Keep a fire extinguisher and perform regular maintenance and inspection of it.
- If a fire occurs during processing, take good care of yourself. For a small flame, you can wait for it to go off; for a larger fire, please keep a safe distance and use a fire extinguisher to put it out.

4. Electrical safety

Caution

Read the following warnings and suggestions carefully:

- Do not open any access panel on the device when the device is connected to the power supply. Accidental contact with the power supply may cause injury.
- Do not touch any electronic area with your hands or other tools when the machine is connected to a power supply.
- The power switch is on the back of the device. Press (-) to power it on and press (o) to power it off.

5. Warning and instruction signs

On xTool S1, the warning and instruction signs are labeled where physical injuries or damage to the machine may be caused before and/or during operation. If a sign is damaged or lost, replace it immediately. You can use the following template to print the sign you need.



List of items



xTool S1



Laser module



Screwdriver



x 11

Screw M3*8



USB cable



Distance sensor



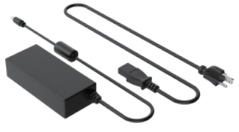
Key



Smoke exhaust pipe



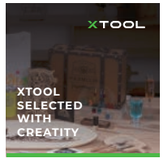
Parts storage box



Power cable and adapter



Material pack

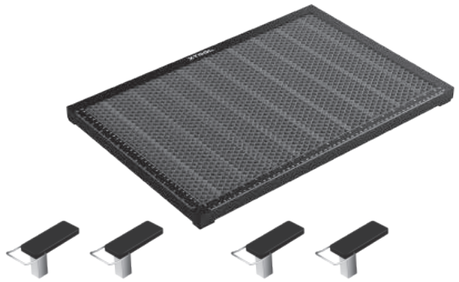


Brochure



User manual

The following items are included only in some packs.



Honeycomb panel components

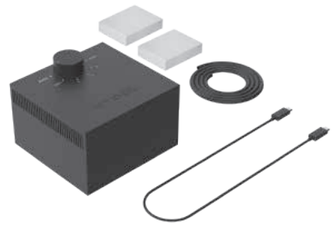


Rotary attachment components



Riser base

A



Air assist set components

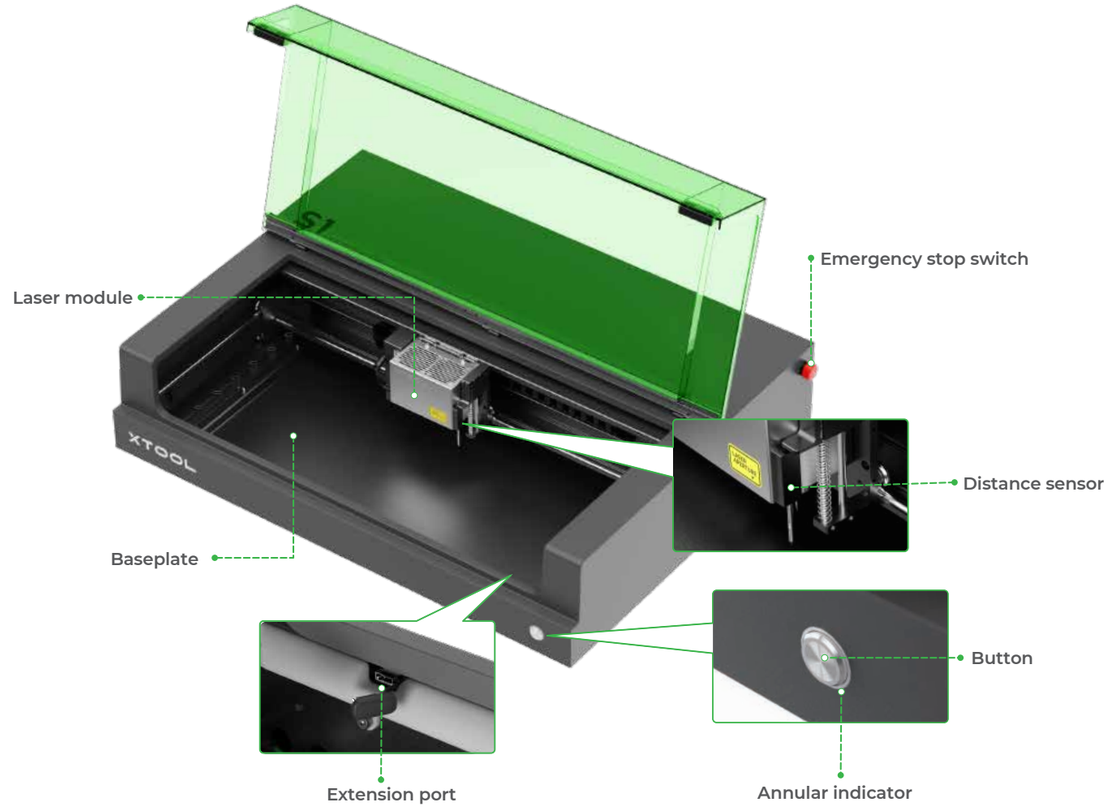
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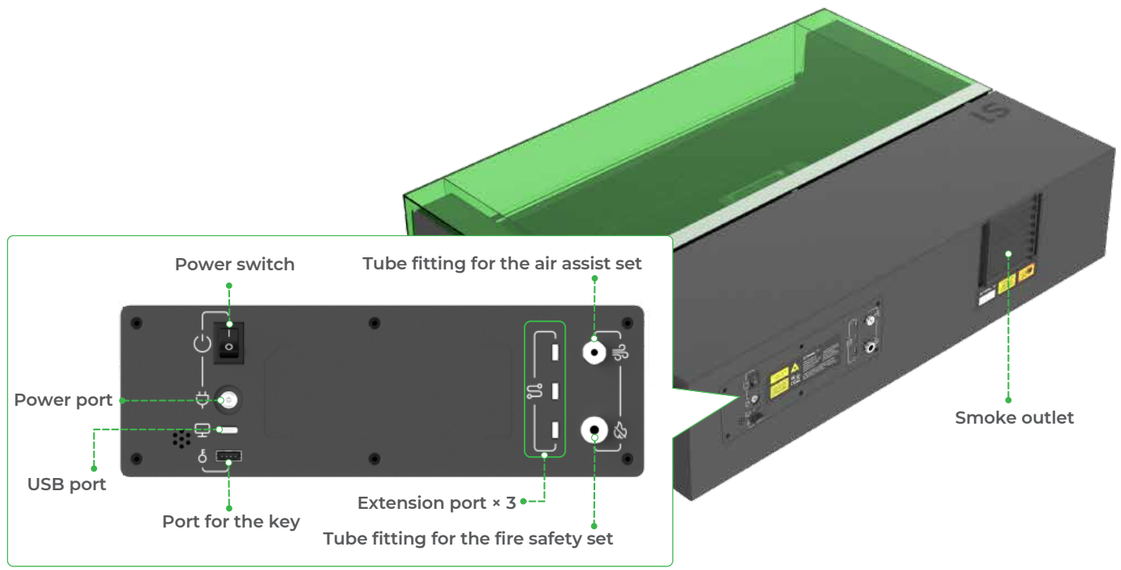


Air assist set components

The adapter is included only in some packs and may vary according to pack.

Meet your xTool S1





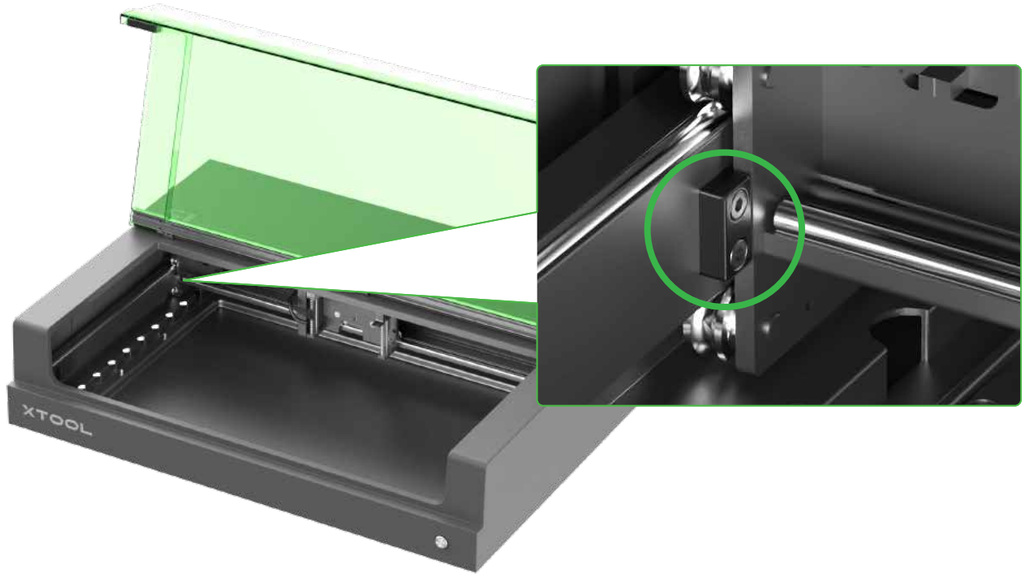
Use your xTool S1

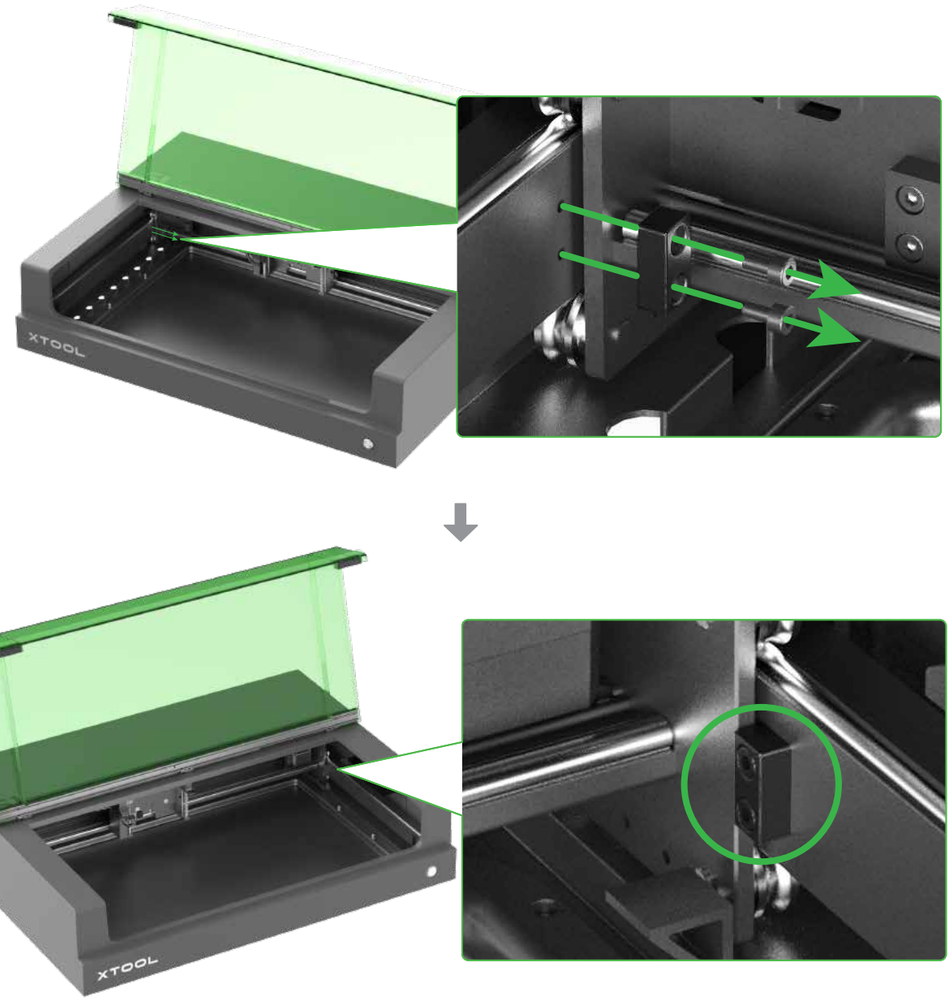
Preparations

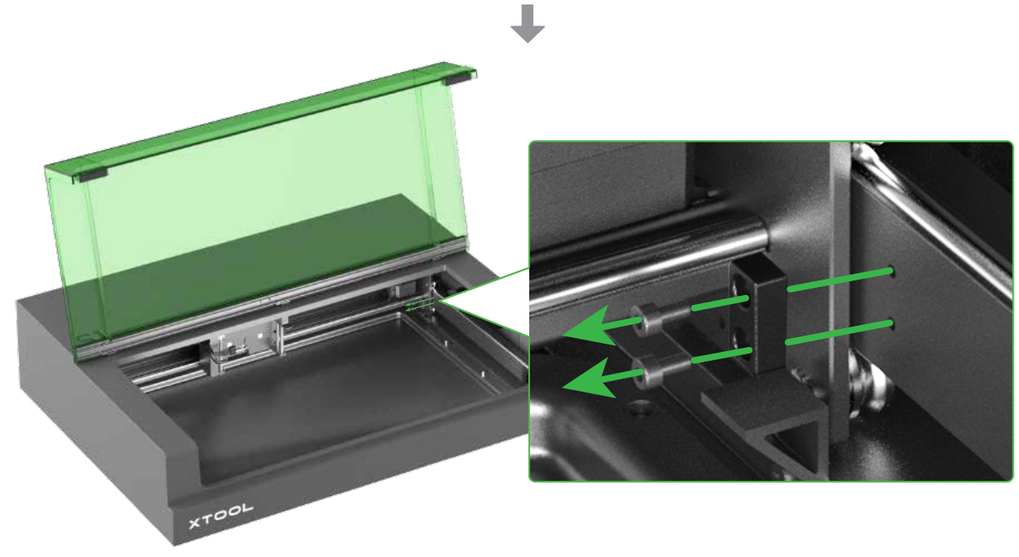
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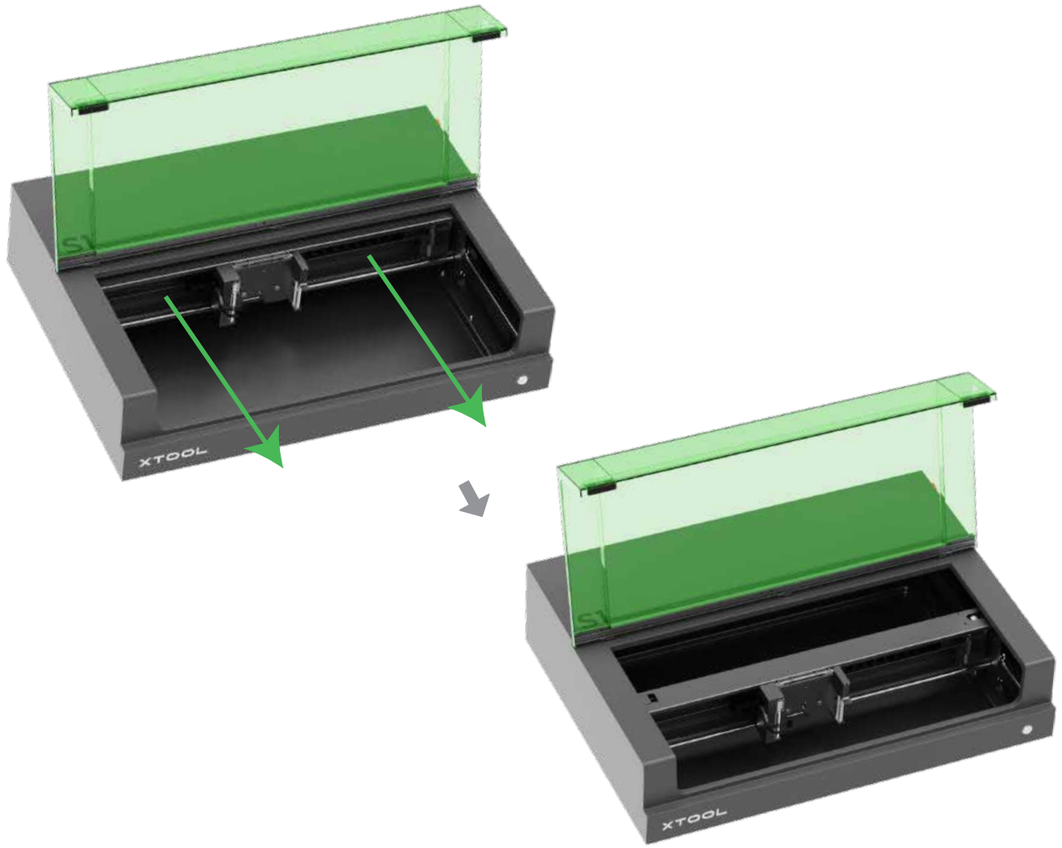






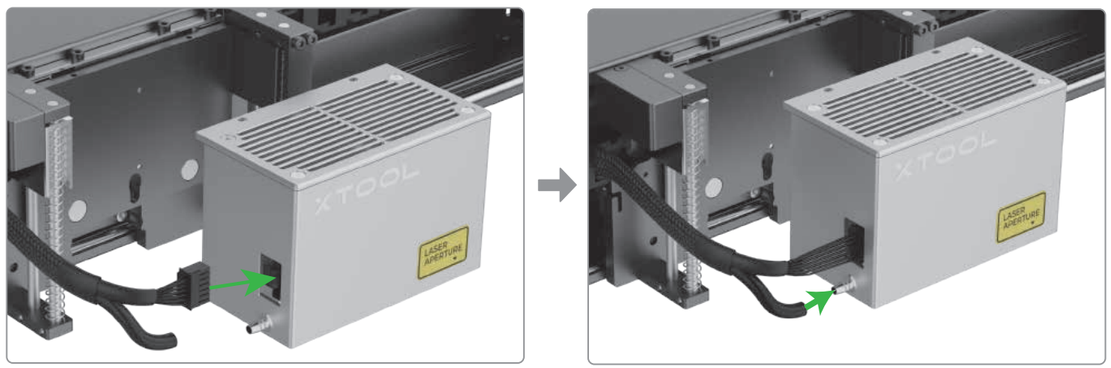


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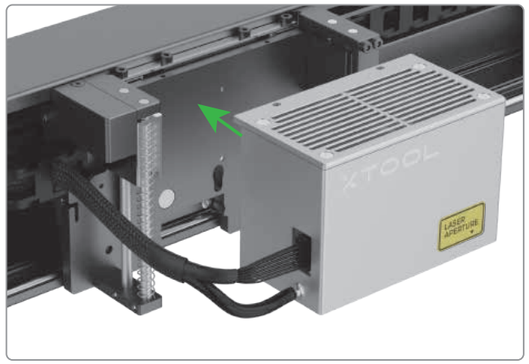


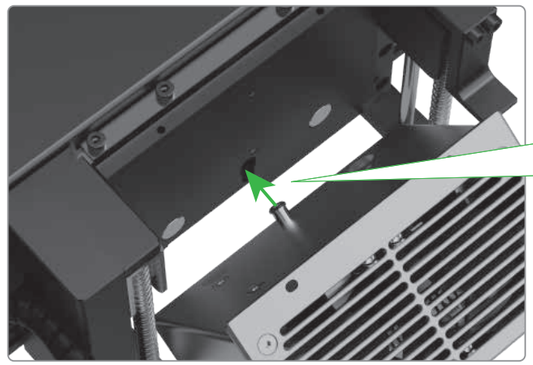


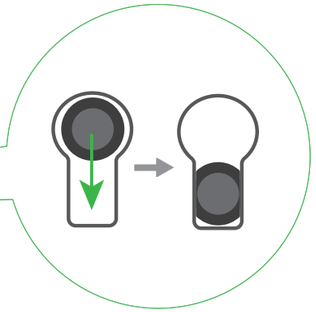
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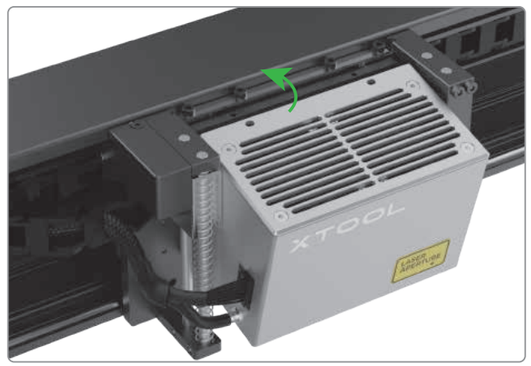
M3*8 ×2

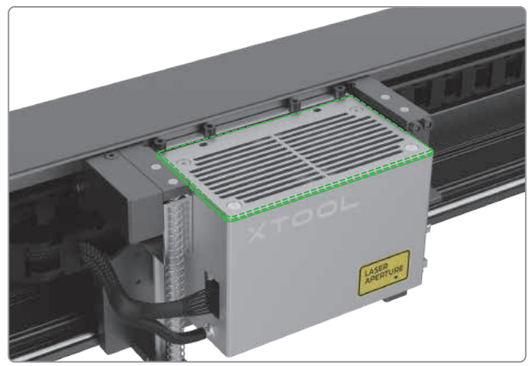


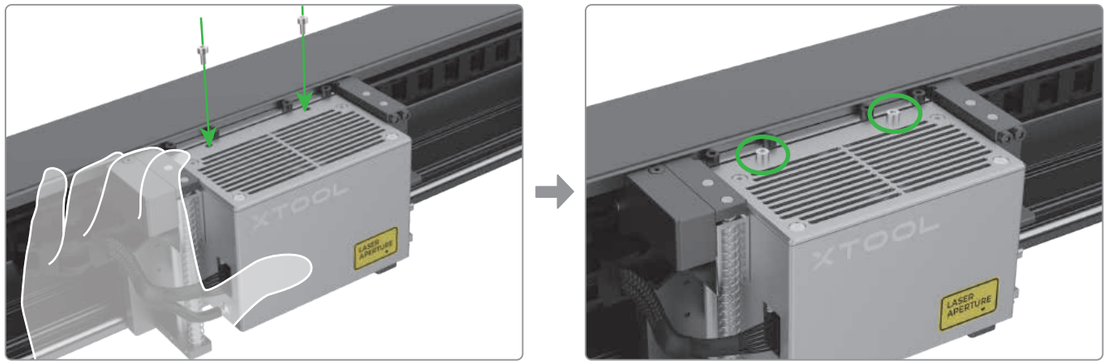




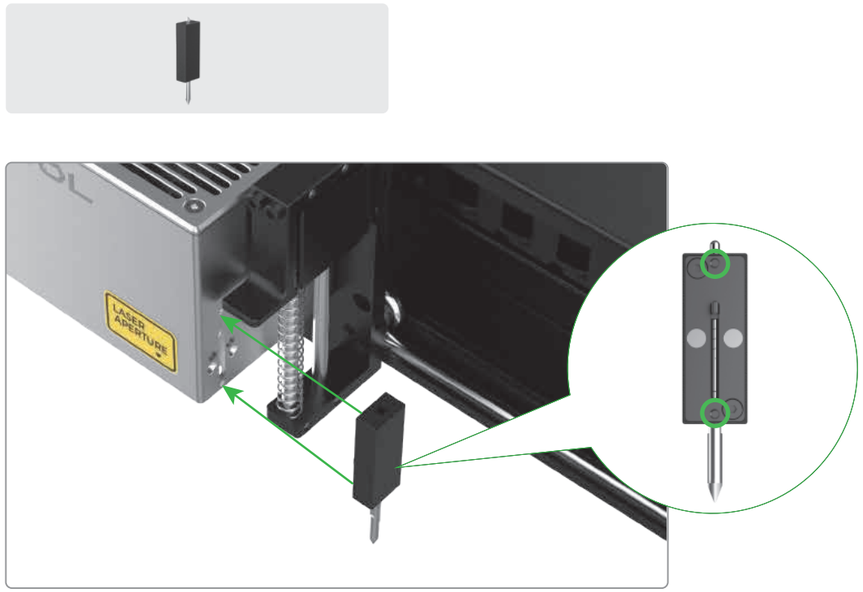
After inserting the locating pin, move it down to lock it in the slot.

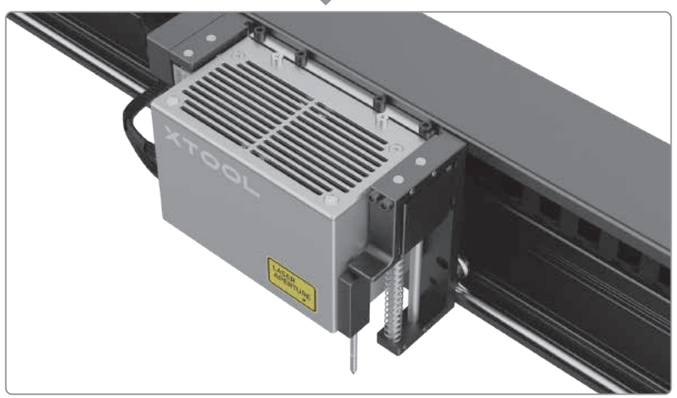






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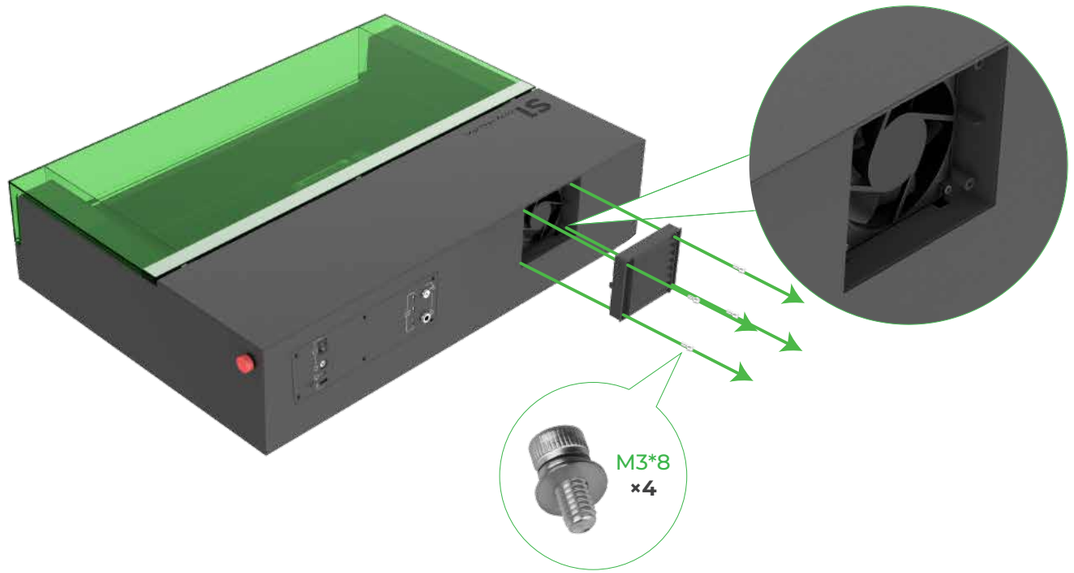


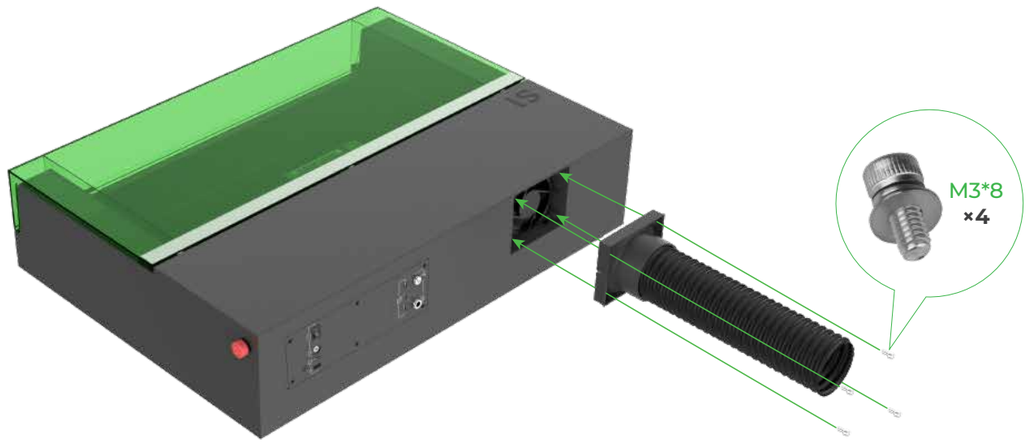


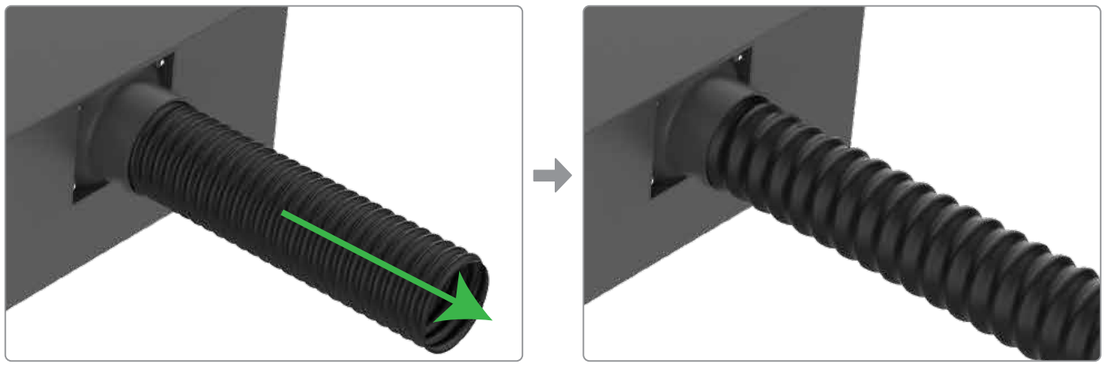
6



> Do not leave the fan exposed. Laser beams may leak out, and your hands may get hurt when touching the fan.

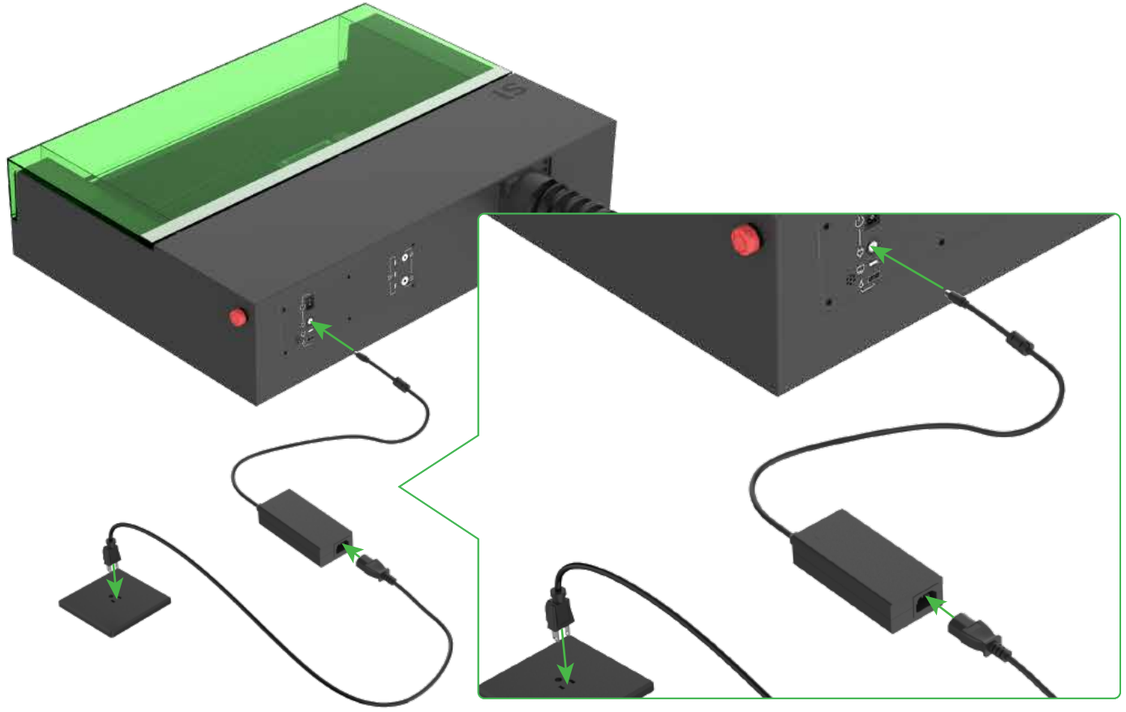




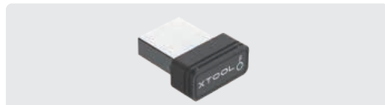


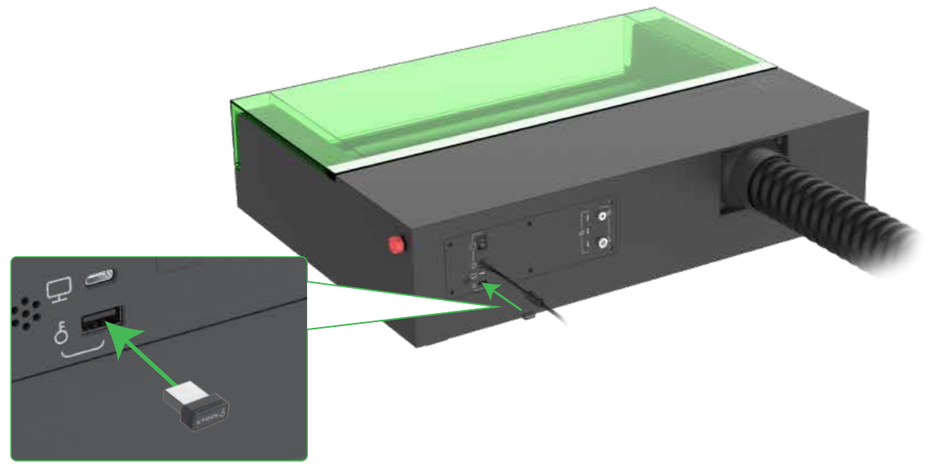
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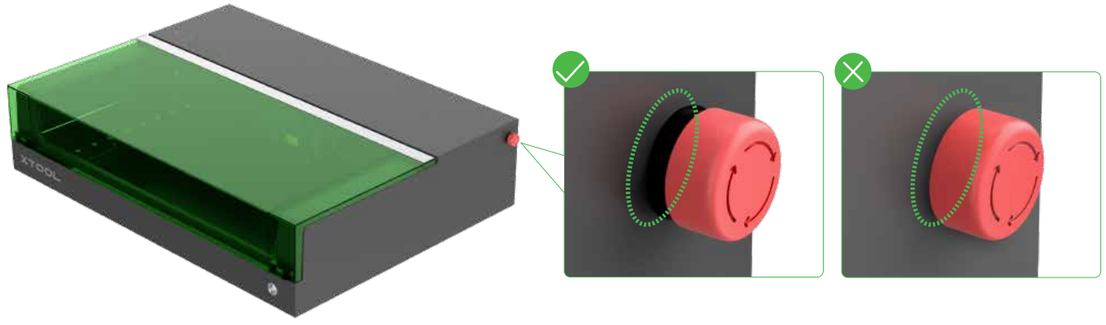
8





9

Ensure that the emergency stop switch is not pressed.



Use software to operate xTool S1

A



1 Download and install **xTool Creative Space (XCS)** or the third-party software **Lightburn**.

xTool Creative Space



OR

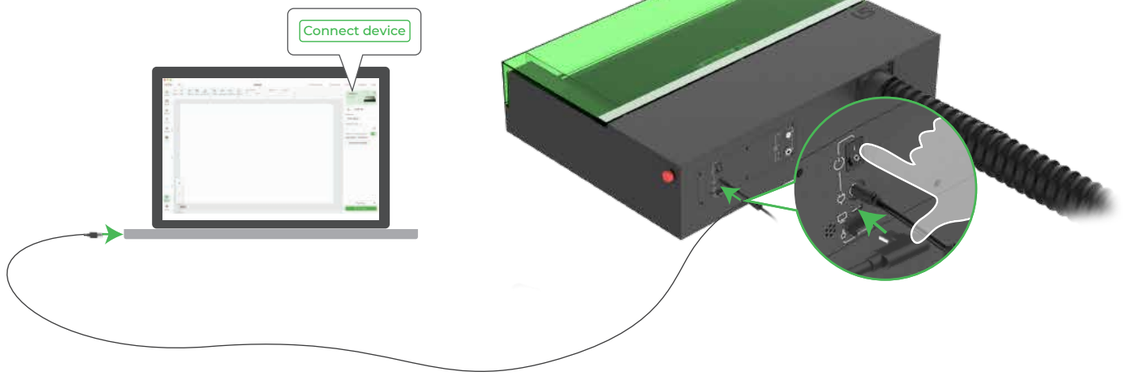
LIGHTBURN
BETTER SOFTWARE FOR LASER CUTTERS



You need to purchase Lightburn before using it.

2 Turn on xTool S1, connect it to a PC, and then connect it on the software.





B



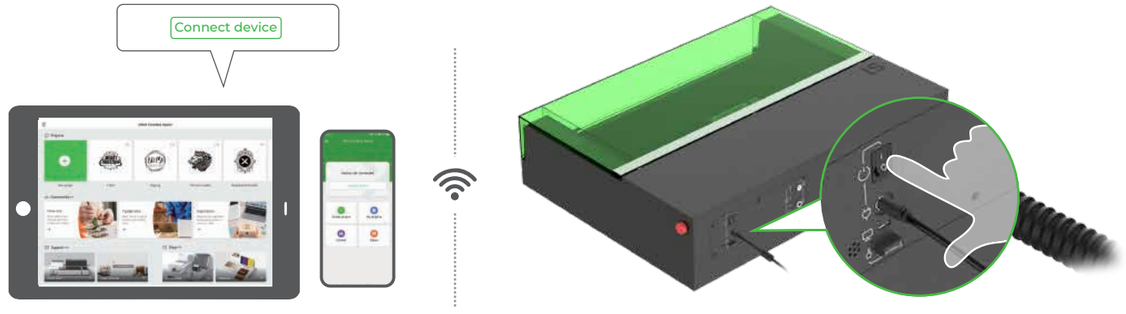
1 Search for **xTool Creative Space** in an app store or visit **xtool.com/software** to download and install the app.



OR



2 Turn on xTool S1. Follow the instructions on XCS to connect xTool S1.



You can start your creation after connecting xTool S1 to the software.
For details about how to use the software to operate xTool S1 for material processing, visit support.xtool.com.

Example projects

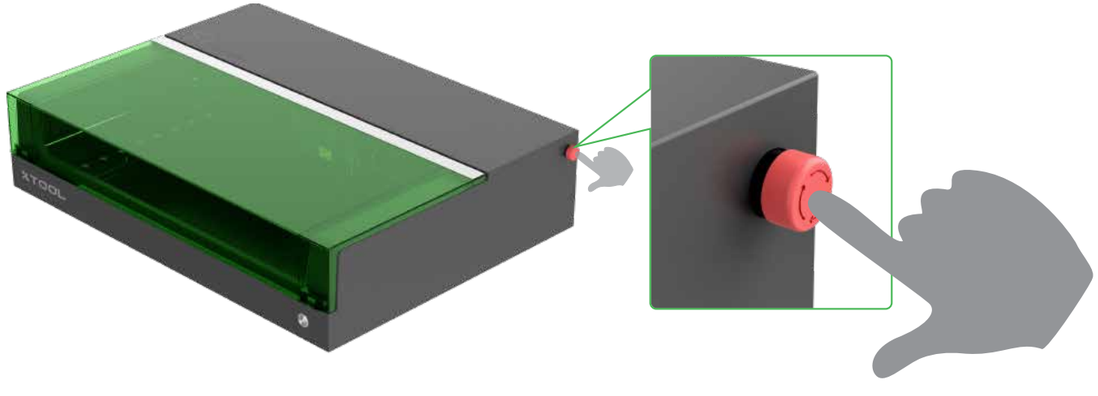
Scan the QR code to find example projects and tutorials. Alternatively, you can visit **support.xtool.com** and click xTool S1 to view example projects and tutorials.

xTool S1 is delivered with a material pack that allows you to start your creation.

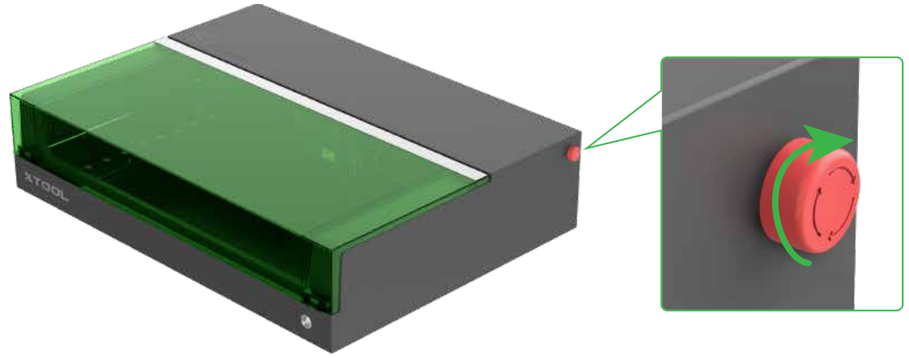


Emergency stop

If an emergency occurs, you can press the emergency stop switch to shut off the machine.

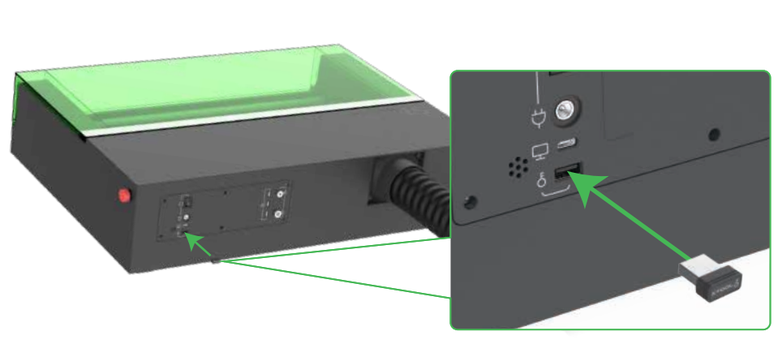


After dealing with the emergency, you can turn the emergency stop switch to reset it.

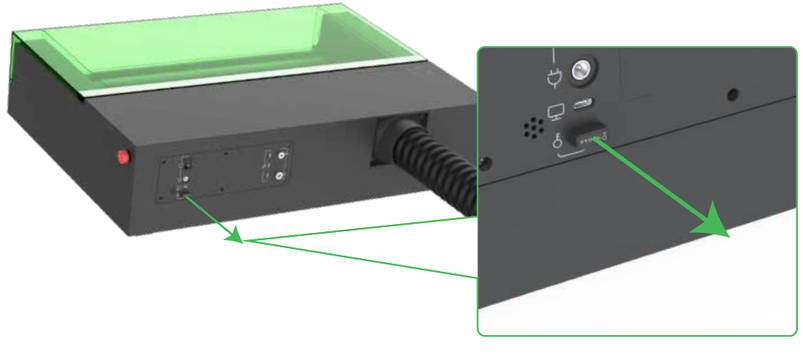


Operation access control

You can insert the key to unlock the processing and related functions.

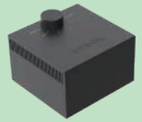


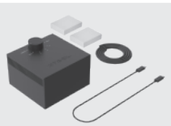
To prevent others from using your machine, you can remove the key to lock the processing and related functions.



Use xTool S1 with the air assist set

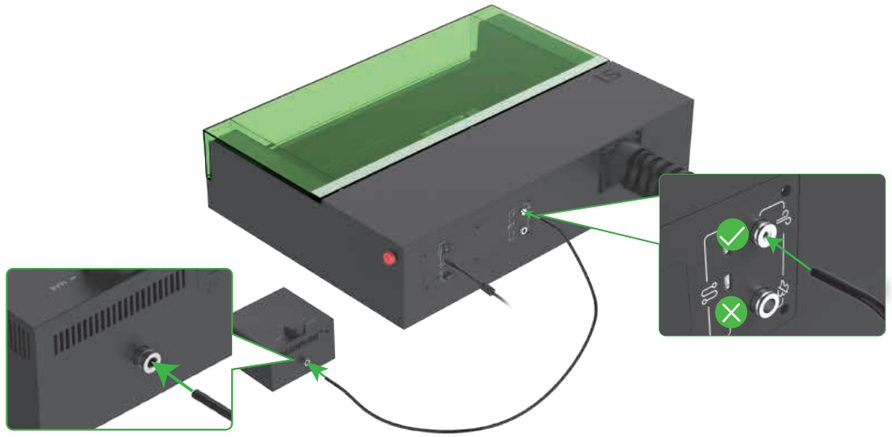
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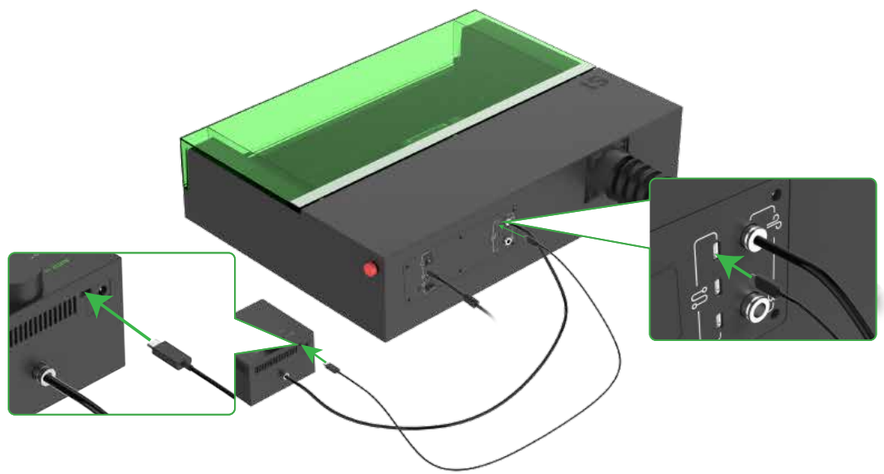
If the pack you purchase does not include the air assist set, you need to purchase one before using it.

1

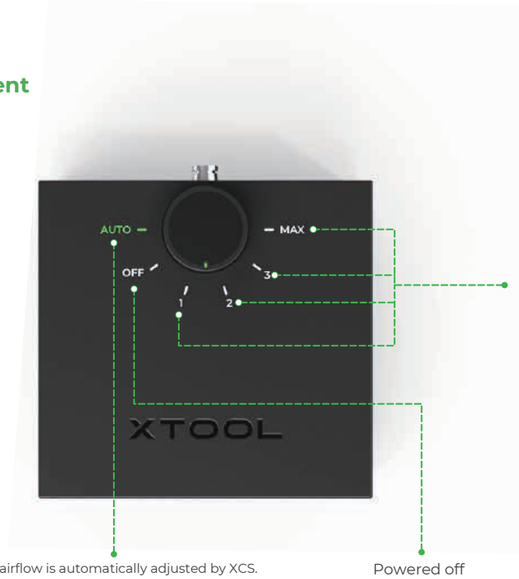


2

The air assist set will be powered by xTool S1.



Airflow adjustment



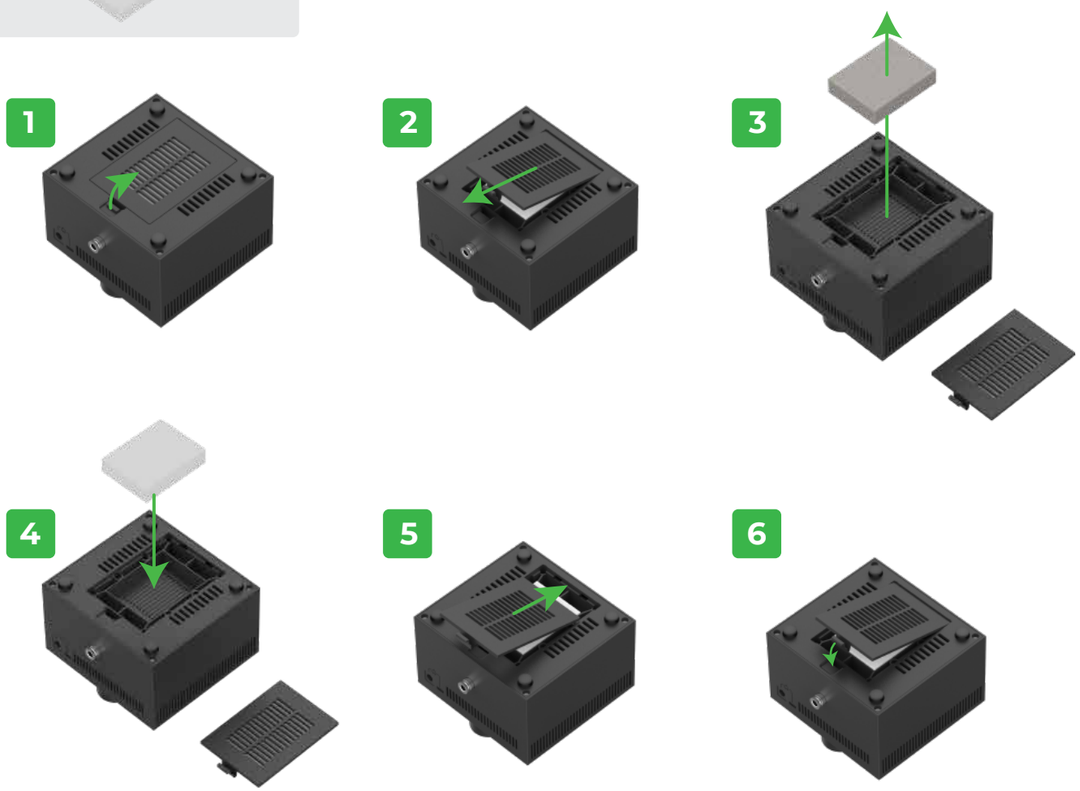
The airflow increases from 1 to MAX. You are advised to use a small airflow for engraving and a large airflow for cutting.

The airflow is automatically adjusted by XCS.

Powered off

Replace the filter





B



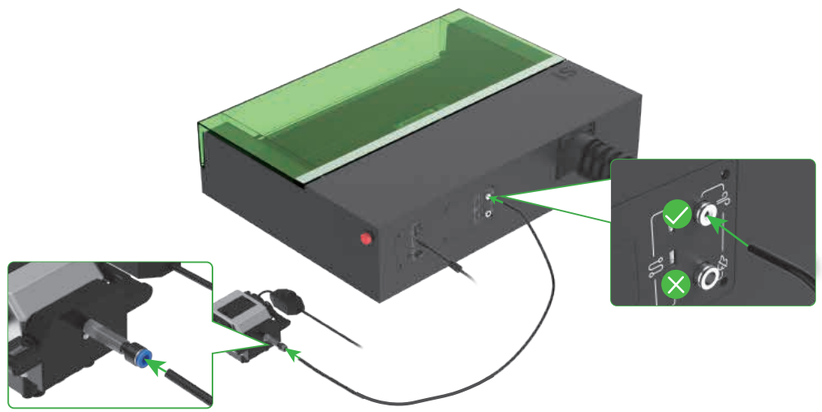


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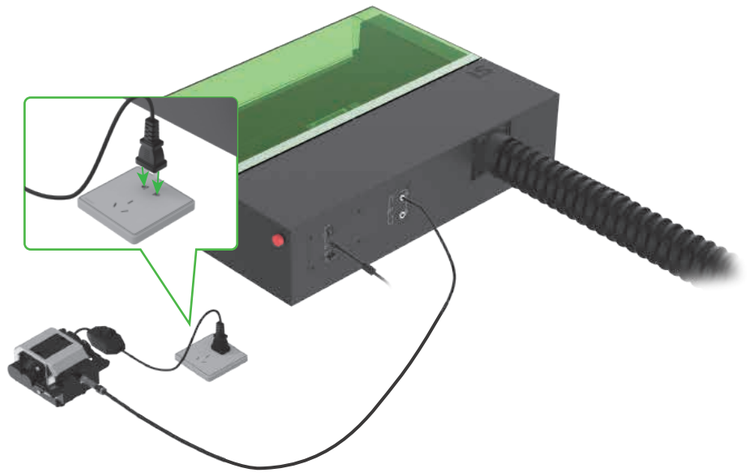
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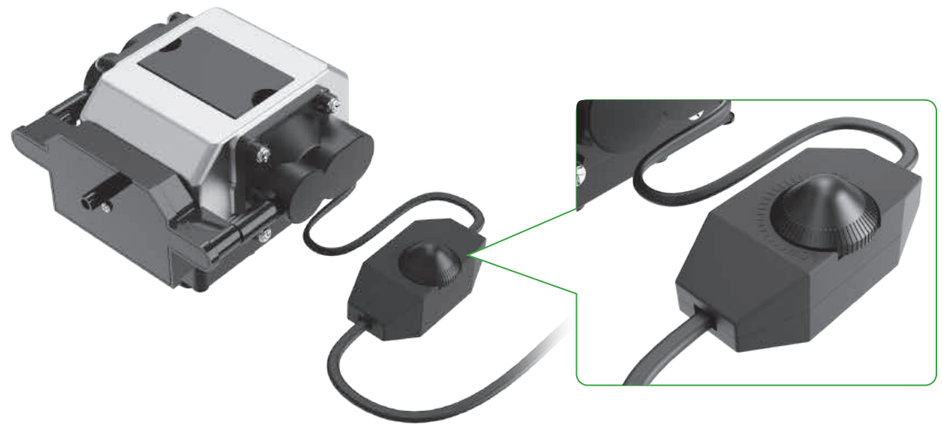
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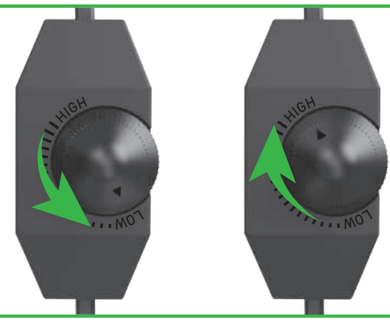


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4



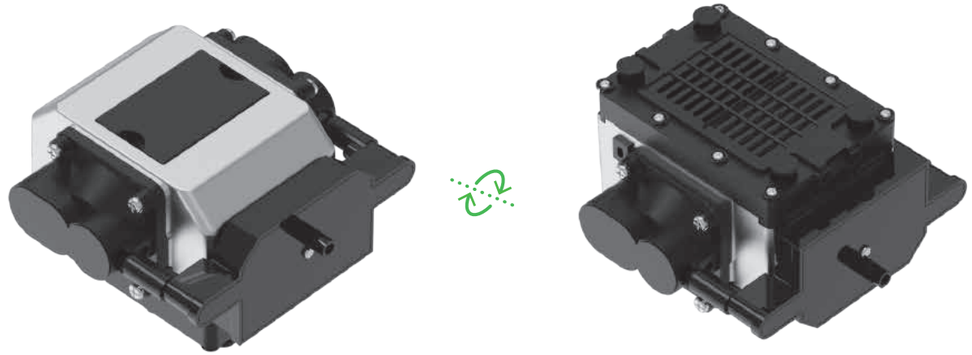


Turn the knob to adjust the airflow.

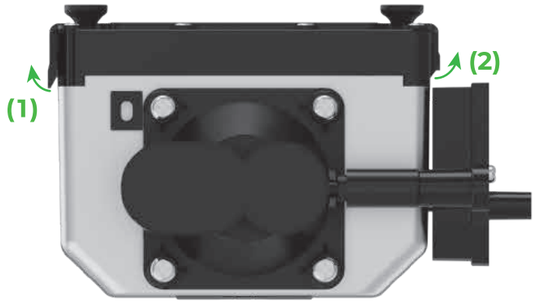
Replace the filter



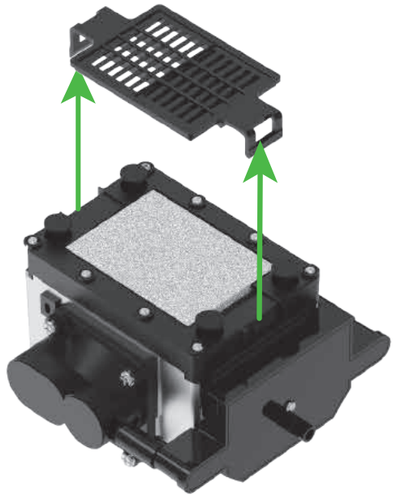
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2

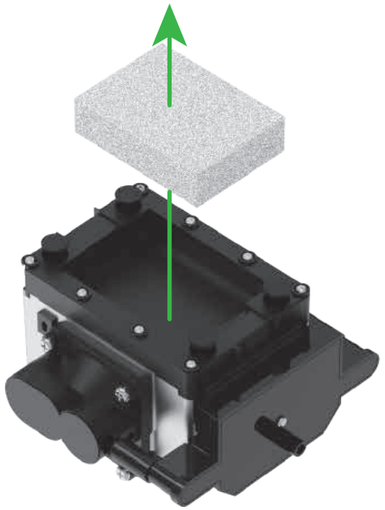


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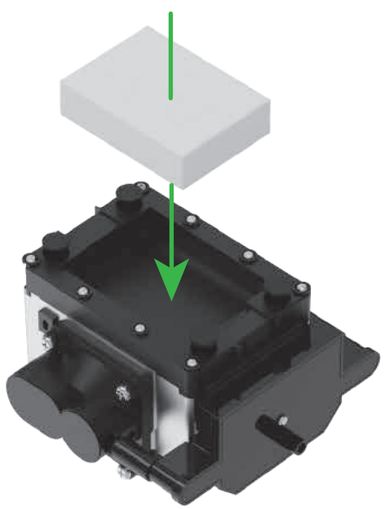


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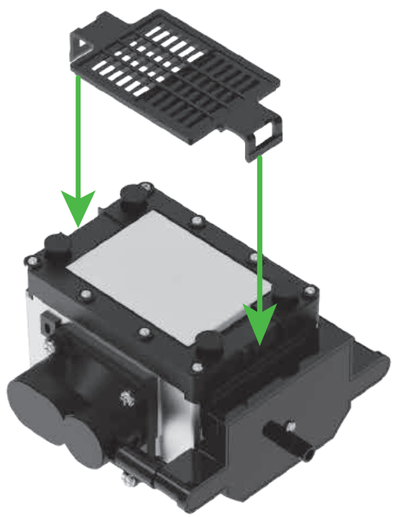
Do not use the filter if it is moistened.



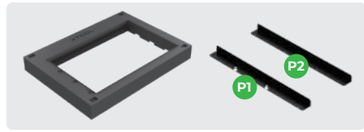
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6



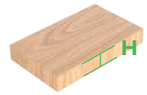
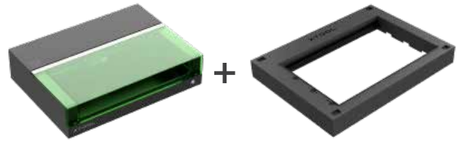
Use xTool S1 with the riser base



If the pack you purchase does not include the riser base, you need to purchase one before using it.

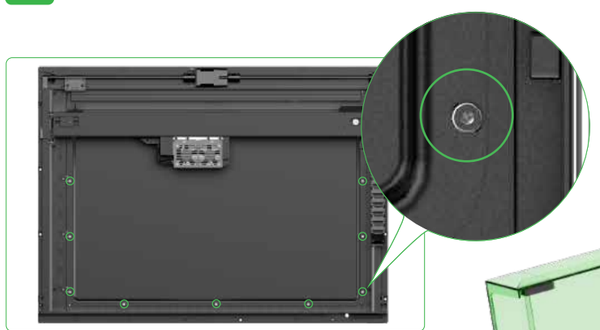
If you do not need to use the riser base, do not place the machine on it. The riser base will block the air inlet of the machine (with the baseplate in place).

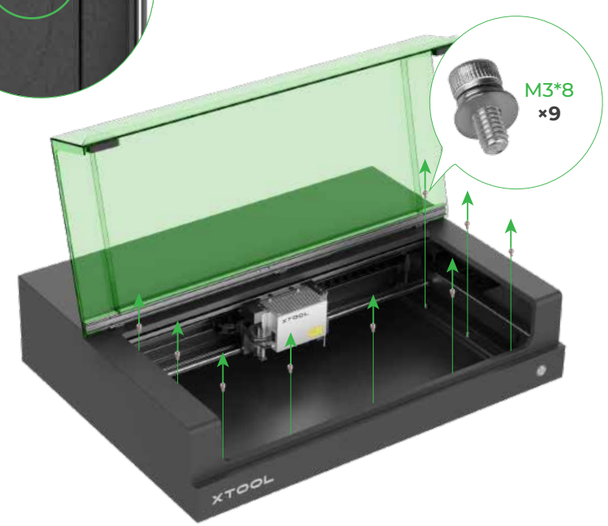
Thickness of materials supported (H)

	 0 mm < H ≤ 42 mm
	 70 mm ≤ H ≤ 125 mm

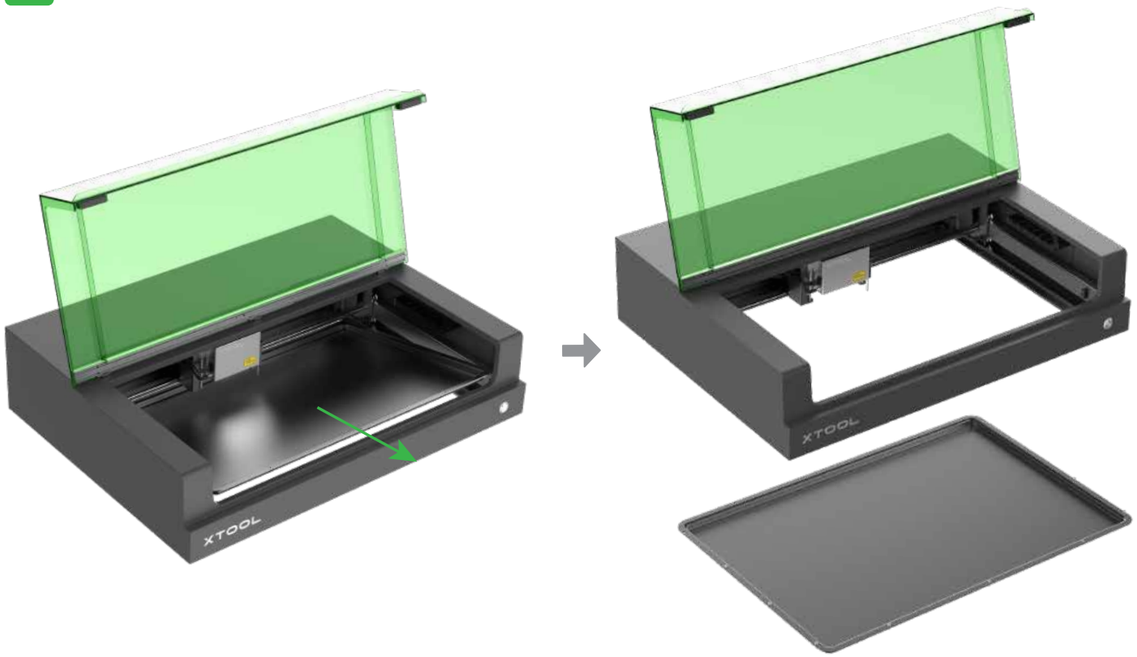
To process a material of thickness 42 mm < H < 70 mm , you need to use an object to raise the height of the material.

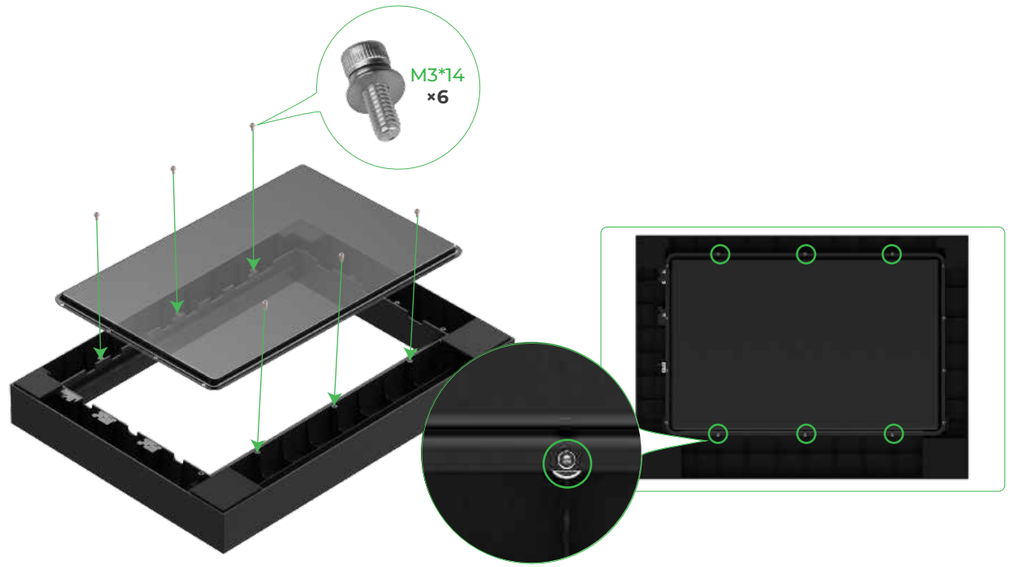
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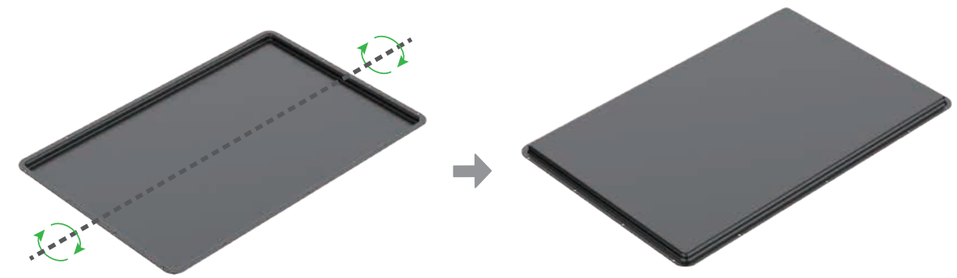
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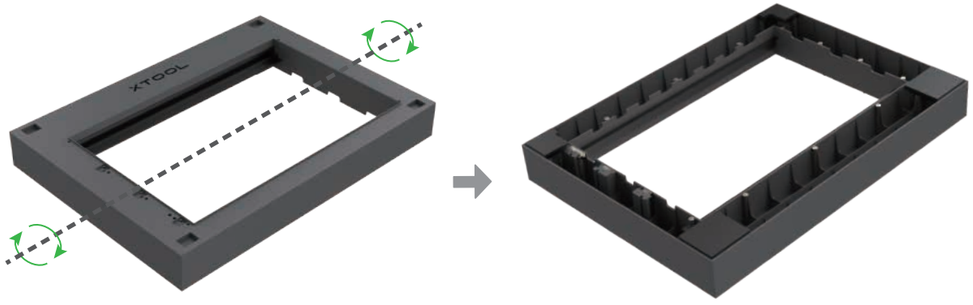


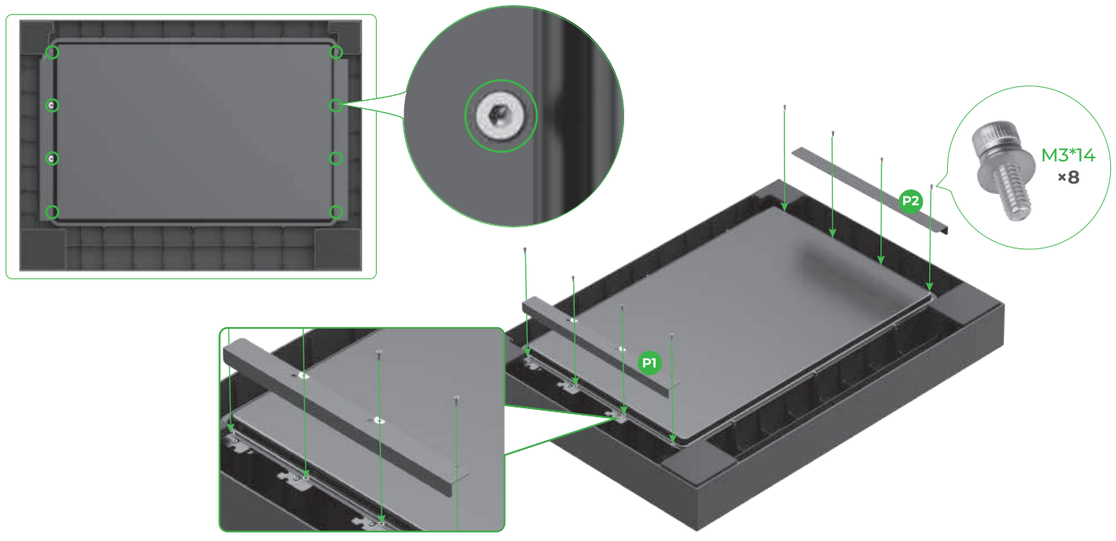


3

M3*14 ×14



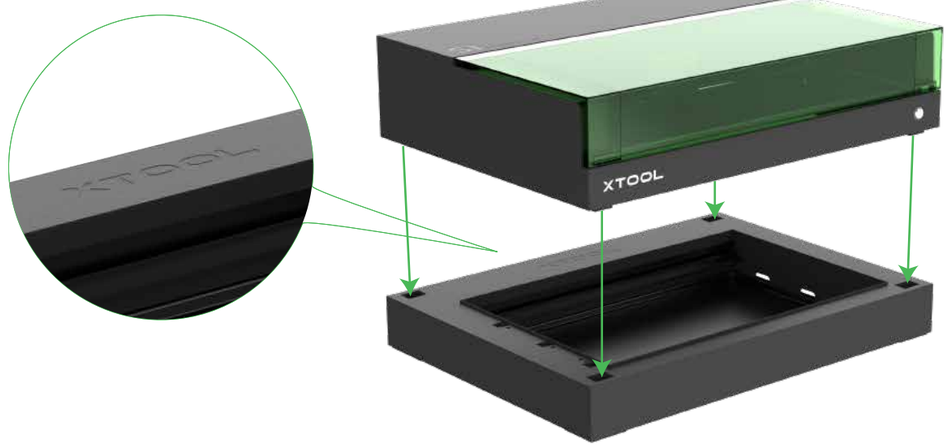




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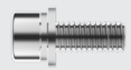




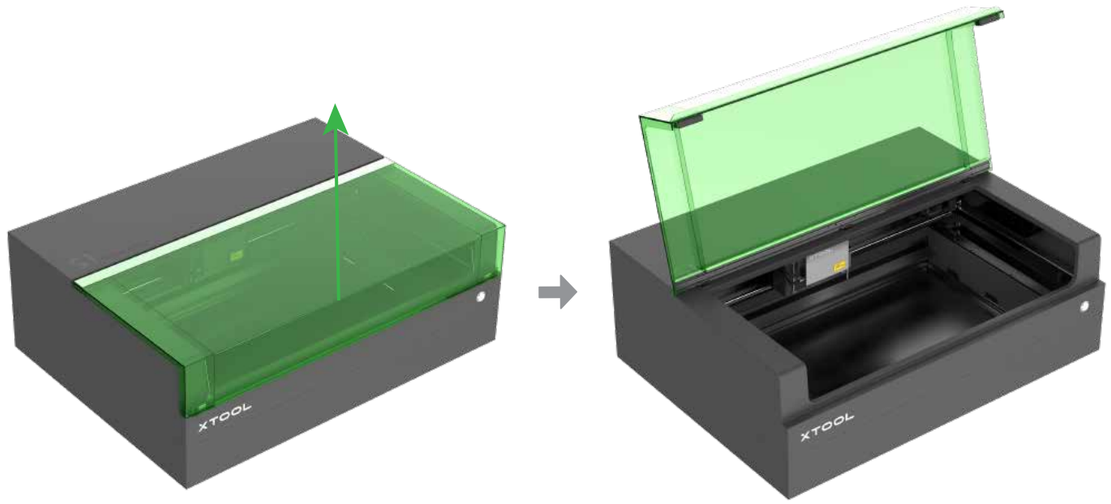


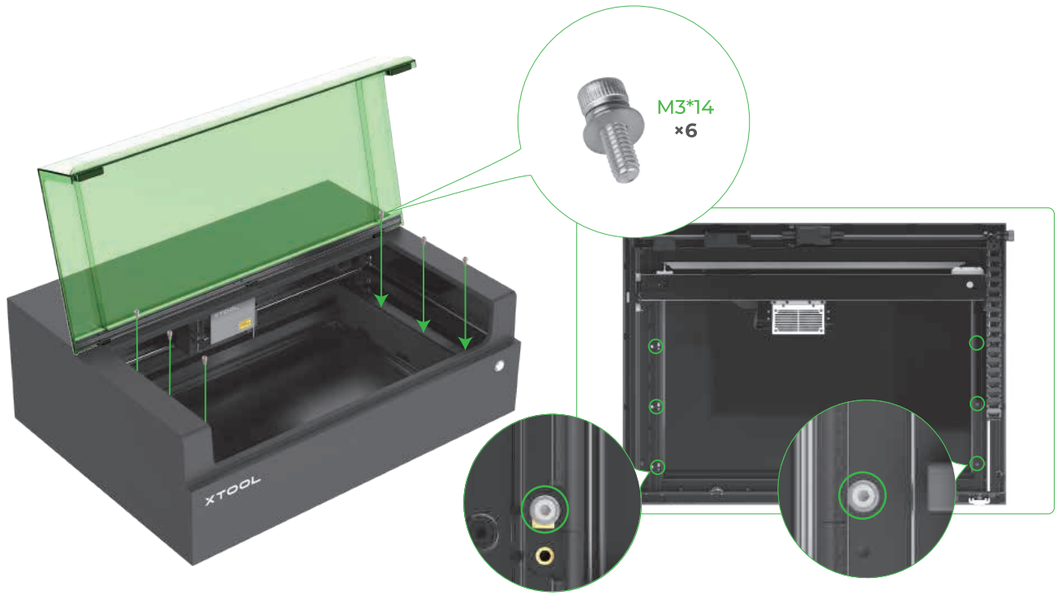
Place the side with the "xTool" logo as the rear side.

5

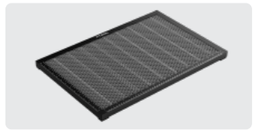


M3*14 ×6





Use xTool S1 with the honeycomb panel

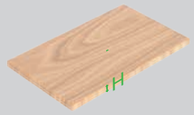


If the pack you purchase does not include the honeycomb panel, you need to purchase one before using it.

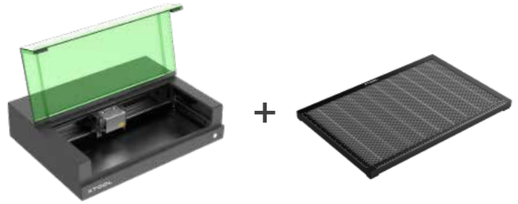
For laser cutting, the honeycomb panel can reduce the areas burned during material processing and protect the baseplate.

Thickness of materials supported (H)

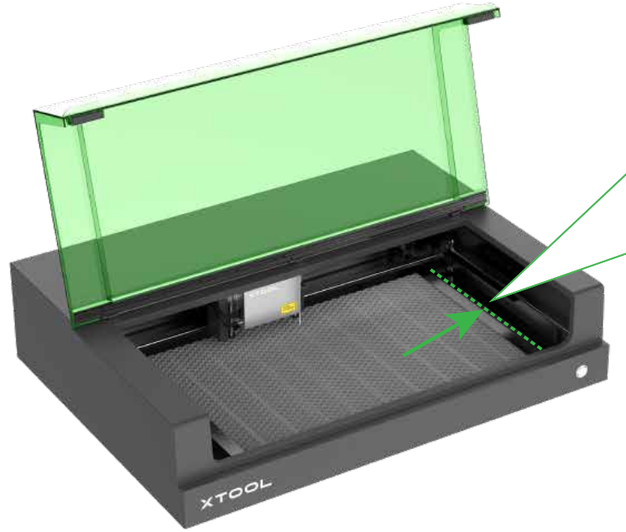


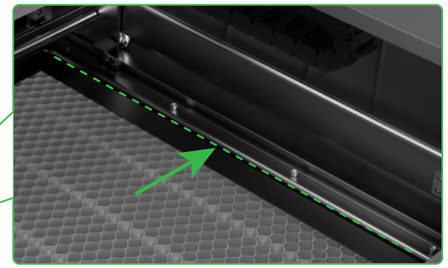


0 mm < H ⩽ 15 mm

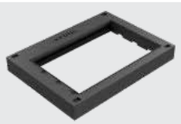


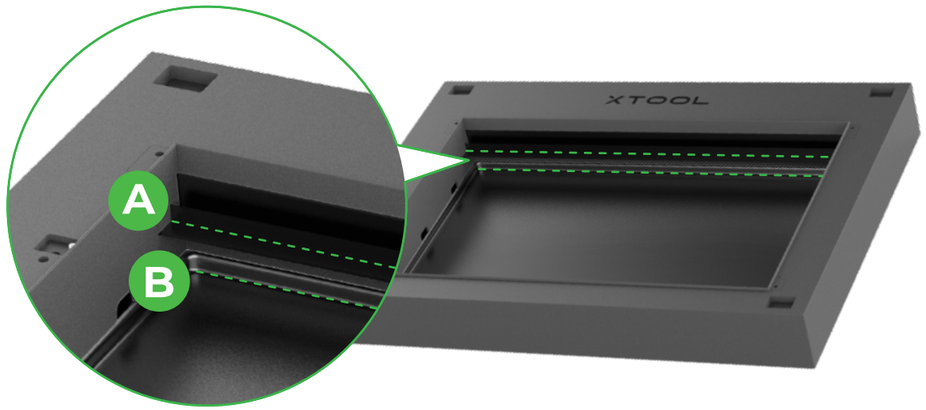


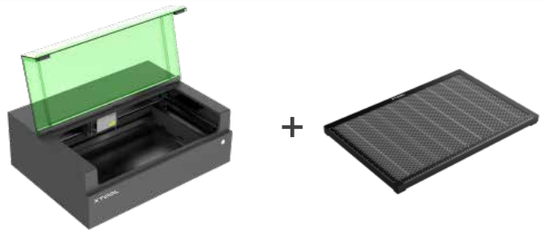


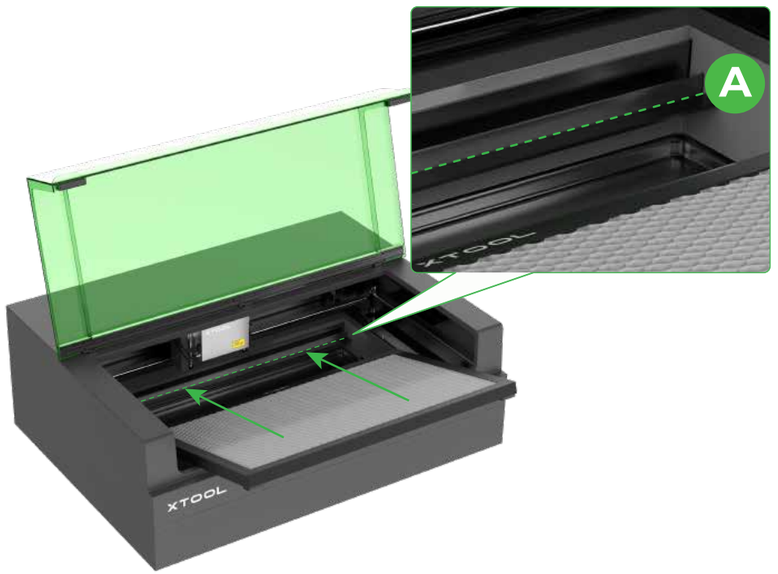


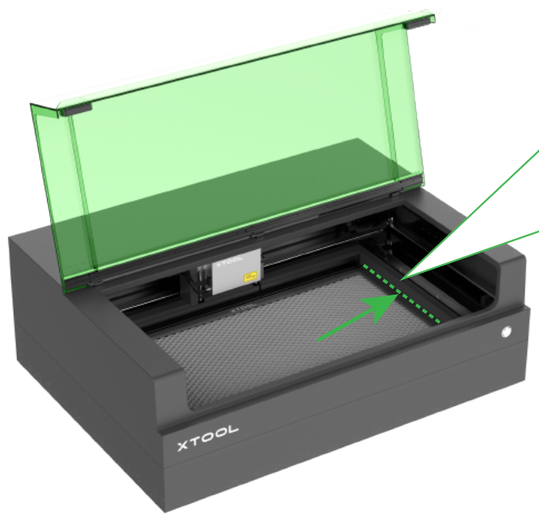
Move the honeycomb panel to the right.

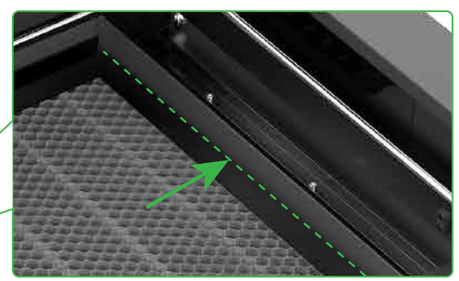




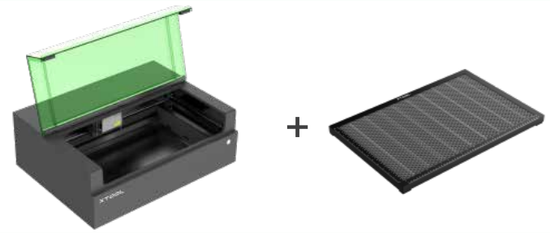
 0 mm < H ⩽ 55 mm	

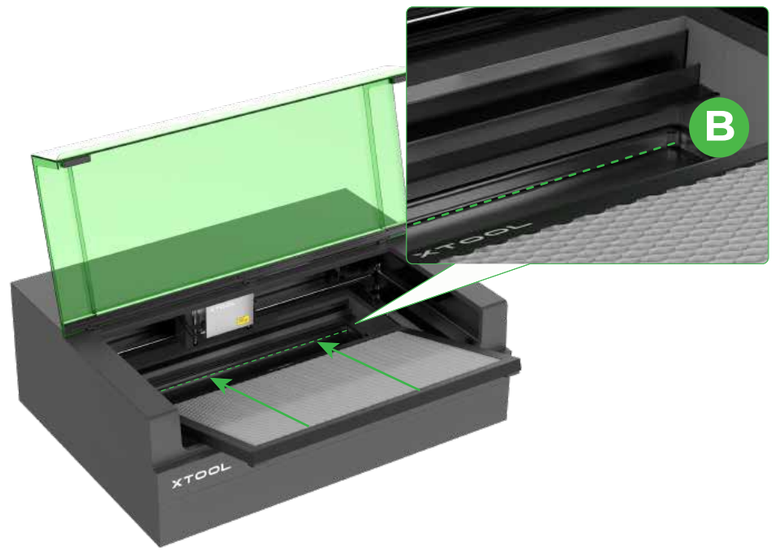


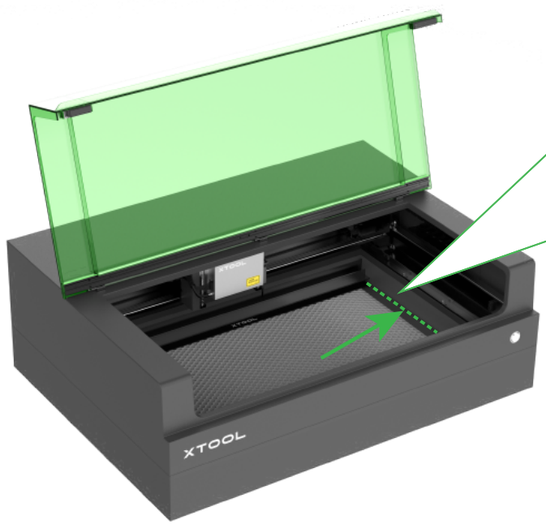


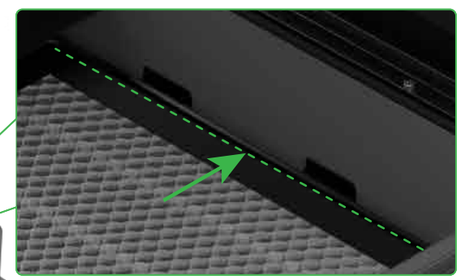


Move the honeycomb panel to the right.

 44 mm ⩽ H ⩽ 99 mm	







Move the honeycomb panel to the right.

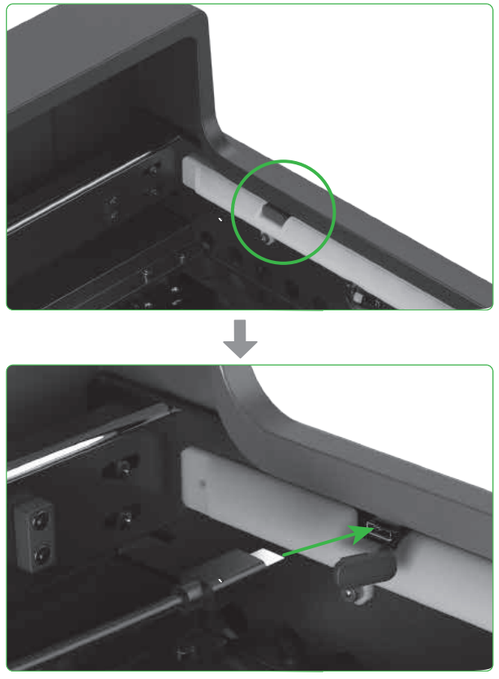
Use xTool S1 with the rotary attachment

The rotary attachment needs to be used together with the riser base on xTool S1. If the pack you purchase does not include the rotary attachment or riser base, you need to purchase them before using them.

With the rotary attachment, you can use xTool S1 to process cylindrical materials.







Understand the annular indicator

Buzzer	Annular indicator	Machine state	Button operation
/	Solid white	Standby	/
	Blinking purple	Network setting (device disconnected from the software)	Long press to set the network
	Solid purple	Standby, connected to the software via Wi-Fi	/
	Blinking white slowly	Starting	/
		Auto focusing	Long press to cancel auto focus
		Measuring curved surface	Long press to cancel curved surface measurement
		Framing	/
	Solid blue	Locating the material	Short press to mark a vertex; long press to cancel material locating
	Blinking green slowly	Performing a task	Short press to pause the processing; long press to cancel the processing
	Blinking purple slowly	Firmware updating	/
	Blinking yellow for 3 times	TF card exceptions occur	/
Buzzing for once	Solid blue	Ready for framing	Short press to start framing; long press to cancel framing
		Ready to work	Short press to start the processing; long press to cancel the processing
	Blinking blue slowly	Task paused	Short press to continue the processing; long press to cancel the processing
	Blinking red	Exceptions occur on movement	Short press to stop the warning
	Blinking yellow	The lid is not fully closed during operation.	/
Buzzing for 3 seconds	Blinking yellow	Exceptions occur	Short press to stop the warning
	Blinking red	Exceptions occur on Wi-Fi communication	/
Keeping buzzing	Blinking red	Flame detected	Short press to stop the warning

After-sales services

For technical support, contact us at **support@xtool.com**.
For more information about after-sales services, visit **support.xtool.com**.

FAQs

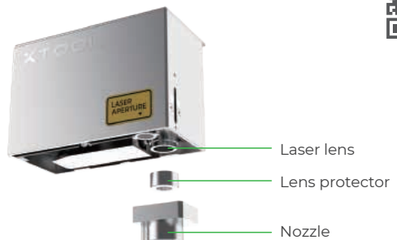
1. Do I need to clean the laser module? If yes, how often?

Yes, you need to clean the laser module regularly. Laser processing often produces a large amount of smoke, which may cause the lens protector to get dirty or block the nozzle. If you do not clean the laser module in a timely manner, the laser power may be reduced and the laser module may be damaged.

Cleaning steps:

(1) Turn off the machine and remove the laser module from the machine.
(2) Remove the nozzle and lens protector one by one from the laser module.
(3) Clean the laser lens, lens protector, and nozzle one by one with a lint-free cloth moistened with alcohol.

For more information on how to clean the laser module, scan the QR code to watch the video.



Without the air assist set, you are advised to clean the laser module at the following frequencies:

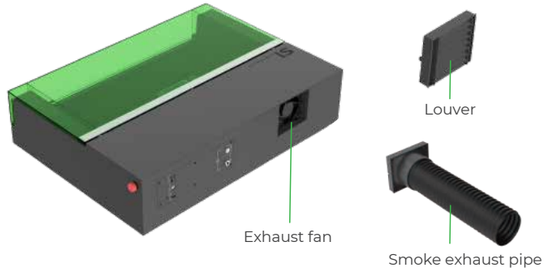
- 10 W laser module: clean it after every 2 hours of processing
- 20 W laser module: clean it after every 1 hour of processing
- 40 W laser module: clean it after every 0.5 hours of processing

With the air assist set, you can clean the laser module at a lower frequency.

2. The smoke is exhausted slowly. Why?

Possible cause:
Too much dust accumulates on the exhaust fan.

Solution:
(1) Turn off the machine and remove the louver or smoke exhaust pipe from the machine.
(2) Clean the exhaust fan with a tissue or cotton swab moistened with clean water or alcohol.
(3) Install the louver or smoke exhaust pipe back to the machine.
Otherwise, laser beams may leak out, and your hands may get hurt if touching the fan.



3. The distance sensor does not work in auto focus. What can I do?

Possible causes:

(1) The initialization of the distance sensor fails due to improper installation or early firmware version, and the probe doesn't extend.
(2) The probe of the distance sensor cannot move smoothly due to hardware faults.
(3) The material is too thick or thin, and the material surface to be processed is out of the focusing range.
(4) On a curved material, the probe may slip in a part with a steep angle, causing a distance measurement failure.
(5) The laser module cannot execute the distance sensing function.

Solution:

(1) Check whether the probe of the distance sensor extends during auto focus. If no, try to reinstall the distance sensor. If the probe still fails to extend, try to update the firmware to the latest version.
(2) Remove the distance sensor and check whether its probe can move smoothly. If no, please contact our after-sales service to replace the distance sensor.
(3) Refer to the user manual and use a processing way applicable to your material thickness.
(4) For a curved material, you can try to adjust the processing area to a flatter one, so that the probe can measure the distance in a flatter area.
(5) If the distance sensor still fails to measure distance, please contact our after-sales service. Before the problem is solved, you can measure the distance manually. For more information on how to measure the distance, see **support.xtool.com**.



(Probe not extending)



(Probe extending)

4. The software prompts that the baseplate is not installed properly. What can I do?

Possible cause:
The screws securing the baseplate are loose.

Solution:
Tighten all the screws to keep the baseplate in place.

Statement

Thank you for choosing xTool products!

If you use the product for the first time, read carefully all the accompanying materials of the product to improve your experience with it. If you do not use the product according to the instructions and requirements of the Manual, or mis-operate the product due to misunderstanding, etc., the Company shall bear no responsibility for any loss resulting therefrom.

The Company has collated the content of the Manual rigorously and carefully, but errors or omissions may remain.

The Company is committed to continuously improving product functions and service quality, and therefore reserves the right to change any product or software described in the Manual and the content of the Manual at any time.

The Manual is intended to help you use the product properly and does not include any description of hardware and software configuration. For product configuration, refer to the related contract (if any) and packing list, or consult your distributor. Images in the Manual are for reference only and the actual product may vary.

Protected by copyright laws and regulations, the Manual shall not be reproduced or transcribed in any way, or be transmitted on any wired or wireless network in any manner, or be translated into any language, or be modified in any way, such as content, image, or layout modification, without the prior written authorization of the Company.

The Company is committed to continuously improving the product and related materials. The product and the Manual are subject to change, and updates can be found at **xtool.com**.

CE

DECLARATION OF CONFORMITY

Hereby, Makeblock Co., Ltd., declares that this product is in compliance with the essential requirements and other relevant provisions of Directive RED 2014/53/EU and the RoHS directive 2011/65/EU & (EU) 2015/863.

FCC statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.
Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.