



# Catalog

|  |    |
|--|----|
| 1.xTool S1 Won't Fire Laser .....  | 2  |
| 2.The Laser Module Isn't Installed Properly for xTool S1 .....   | 11 |
| 3.FAQs on the Infrared Laser Module for xTool S1 .....   | 18 |
| 4.xTool S1 Fails to Recognize the Laser Module.....  | 24 |
| 5.The Laser Module of xTool S1 Falls Off the Rails or Won't Move Smoothly .....                              | 27 |
| 6.Troubleshooting XCS Error Codes for xTool S1.....  | 33 |
| 7.Troubleshoot "Start processing without a project file or with the lid opened" .....                        | 42 |
| 8.Troubleshoot "Communication exceptions between the laser module and the main controller" for xTool S1..... | 44 |
| 9.Troubleshoot "Baseplate or Rise Base Exceptions" for xTool S1.....   | 47 |
| 10.Troubleshoot "Laser Module Overtemperature" for xTool S1 .....  | 49 |
| 11.Troubleshoot "Distance Sensor Exceptions" for xTool S1.....   | 52 |
| 12.Troubleshoot "Automatic Distance Measurement Can't Be Performed in XCS" .....                             | 58 |
| 13.xTool S1 Cannot Connect to XCS Using a USB Cable .....  | 60 |
| 14.xTool S1 Cannot Establish a Wi-Fi Connection with XCS .....   | 65 |
| 15.Troubleshooting FAQs on Operating xTool S1 with Lightburn .....   | 71 |
| 16.xTool S1 Won't Power On or Seems to Be Non-Responsive .....   | 75 |
| 17.xTool S1 Keeps Processing the Same File .....   | 82 |
| 18.xTool S1 Won't Stop Working When the Lid Is Lifted.....   | 84 |
| 19.Troubleshoot "Sending file failed" for xTool S1 .....   | 87 |



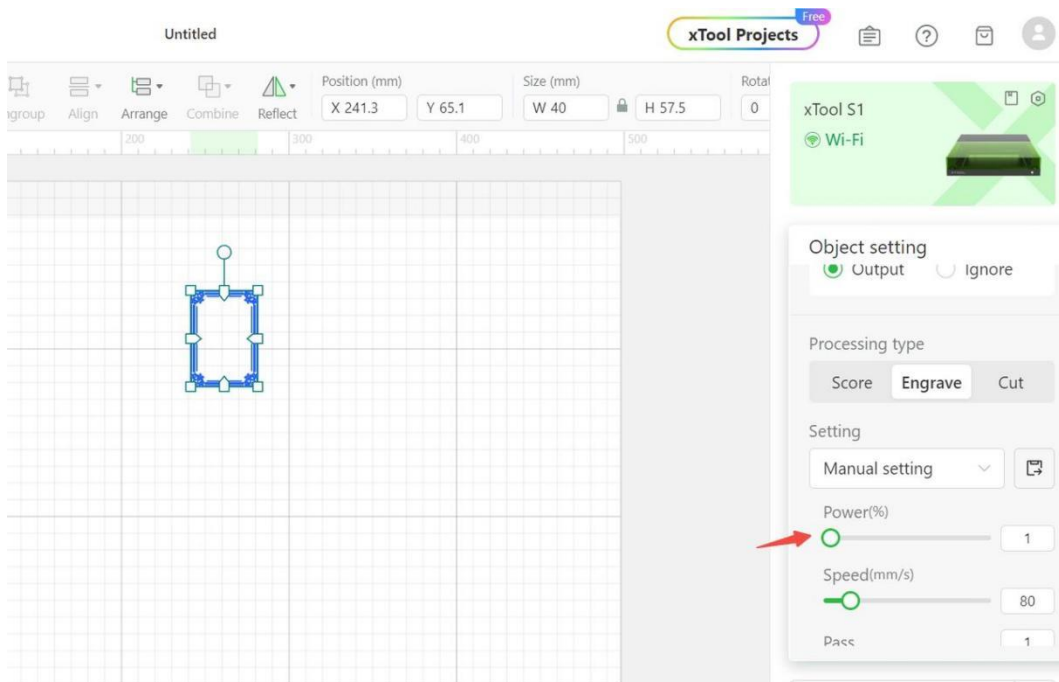
# 1. xTool S1 Won't Fire Laser

## Issue Description

When processing materials with the machine, sometimes you may find no laser coming out of the laser module. Please follow the instructions below for troubleshooting.

### #1 Check the Processing Power

- Increase the processing power if it is set too low.
- If the power is already set correctly, move on to the next steps.





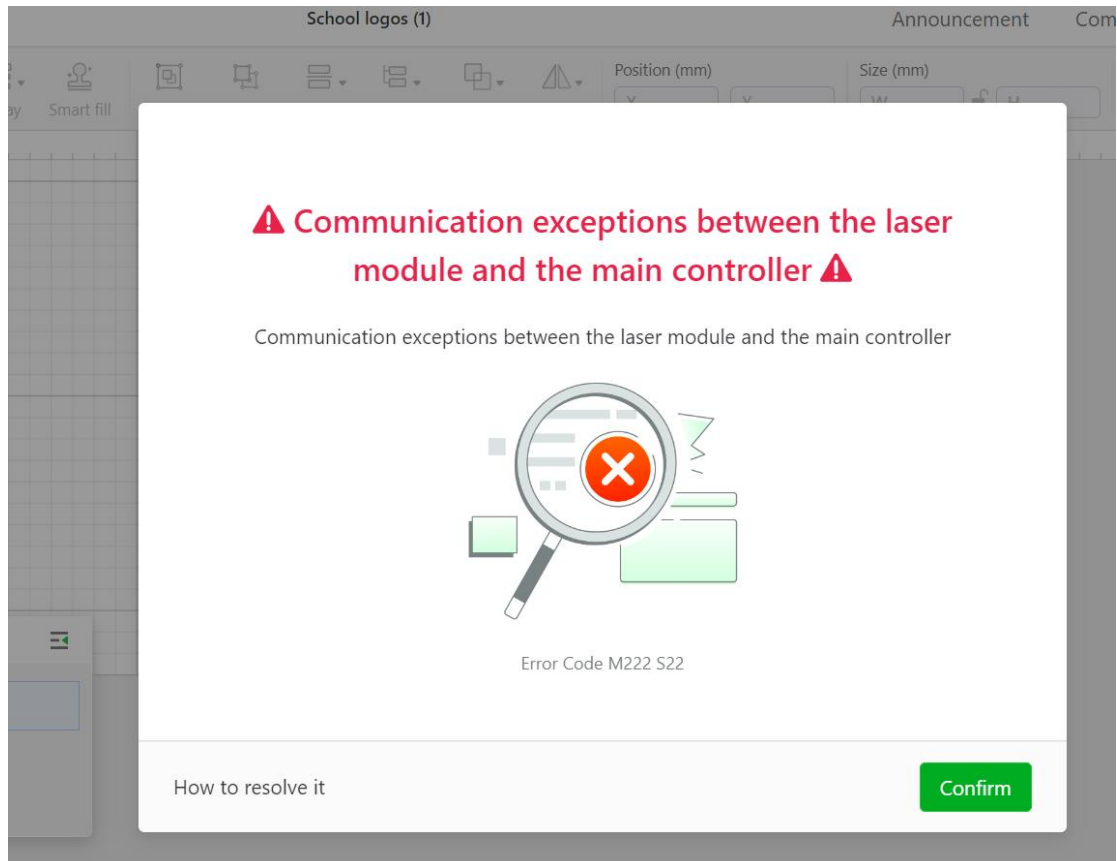
## #2 Check the Connection Cable

- Power off the machine. Unplug and replug the laser module cable for a secured connection.
- Check for any sign of damage to the cable or deformation of the pins on the laser module.





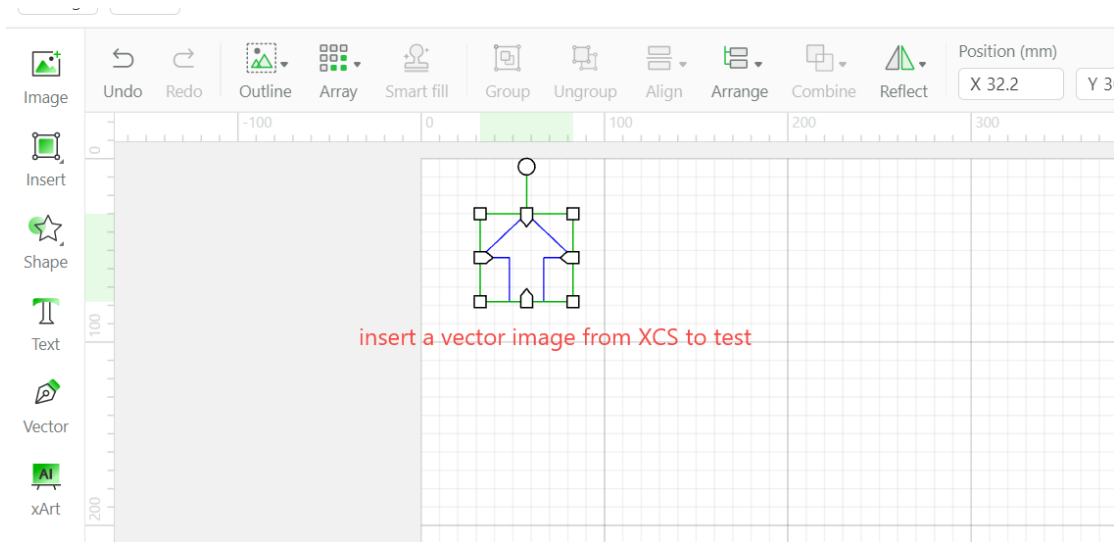
Note: If the cable is loose or the pins are deformed, you may see a pop-up error message that says "Communication exceptions between the laser module and the main controller", as shown below:



### #3 Check the Image Type



- For bitmap images, the laser moves line by line. It will skip fire if a certain area of the design is blank. If yours happens to be blank at the starting area of the job, it may look like the laser is not working.
- To confirm if this is the case, insert a vector shape on the canvas in XCS. See if the laser fires this time.



## #4 Check the Laser Module

1. Set the multimeter to buzzer mode.
2. Put one probe on the GND pin and the other on a non-GND pin.
3. If the multimeter buzzes, the laser module is short-circuited.

Note: A GND and non-GND pair must be tested for accurate results.

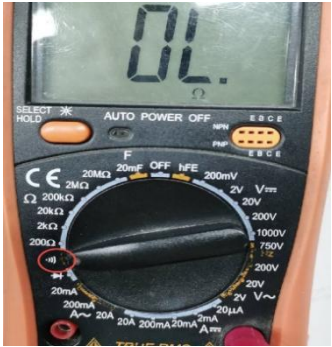
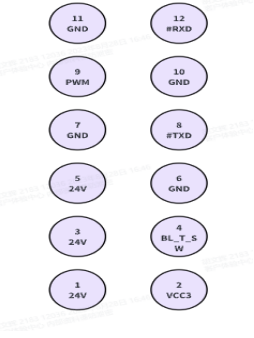

Refer to the diagram and example below for details.

- For example, the following pin pairs can be tested for a short circuit.

11 - 12 / 11 - 9 / 11 - 8 / 11 - 5 / 11 - 3 / 11 - 4 / 11 - 1 / 11 - 2



- In contrast, the following pairs won't do, as they are all GND pins:  
11 - 10 / 11 - 7 / 11 - 6

|   |   |   |
|---|---|---|
|  |  |  |
| <p>The buzzer mode on the meter</p>   | <p>The layout of the pins</p>   | <p>The pins marked with numbers in accordance with the layout</p>                   |

## #5 Check the Power Adapter

- Check if the indicator light of the power adapter is solid green.
- If not, the adapter may be faulty and need replacement.
- For further confirmation, test the output voltage of the adapter.
- Please use the DC voltage mode. The readings should be around 25V.



## #6 Check the Main Control Board

1. Connect the adapter and the emergency stop switch to the main control board as in **Pic 1**.
2. Get a multimeter and follow the four instructions below to test the **readings** on the main control board.
3. If the multimeter buzzes or any of the following readings are inaccurate, the main control board is faulty and requires replacement.

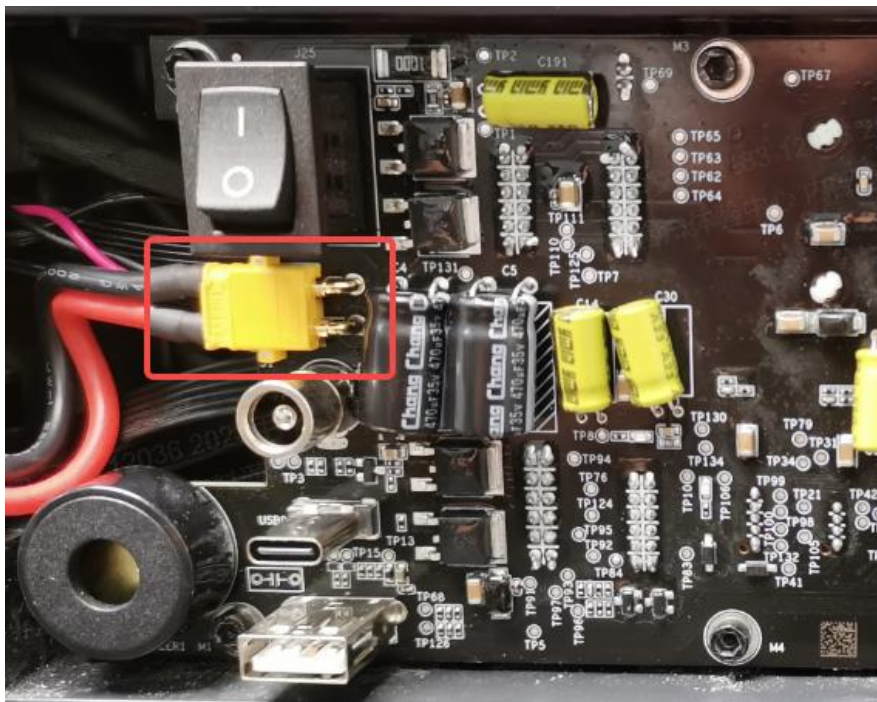
The voltage readings (1) – input voltage test:



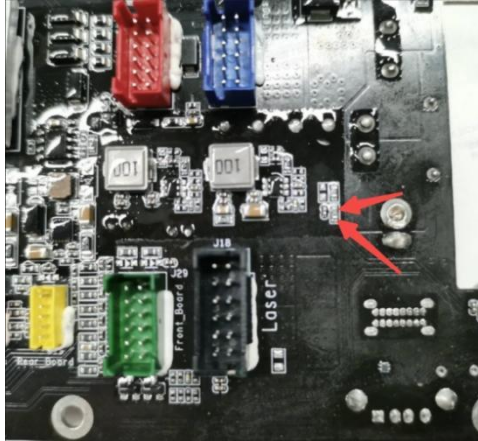
1. Switch the multimeter to voltage mode.
2. Put the probes on the pins as in **Pic 2**.
3. Check if the readings are around 3.2V to 3.3V.

## The voltage readings (2) - short-circuit test:

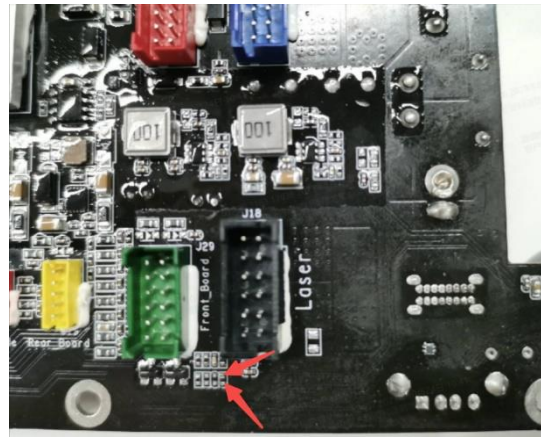
1. Switch the multimeter to buzz mode.
2. Put the probes on the pins as in **Pic 3**.
3. If the multimeter buzzes, the board is short-circuited and needs to be replaced.



Pic 1. Connect the adapter and the stop switch



Pic 2. Pins for input voltage test



Pic 3. Pins for short-circuit test

The voltage readings (3) and (4) – pulse signal and output voltage test:

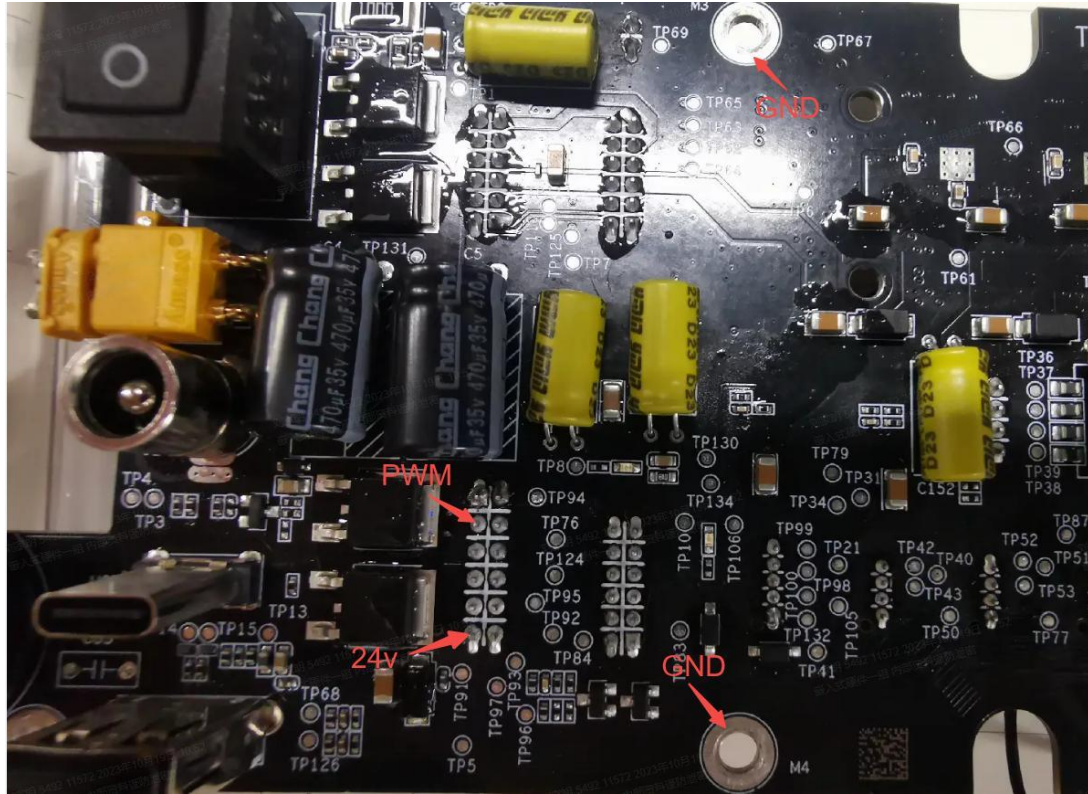
1. Connect S1 to XCS with a USB cable.
2. Laser something and set the power to 100%.
3. Switch the multimeter to DC voltage mode.

- **Pulse signal test**

1. Place one probe on **any GND pin** and the other on the **PWM pin** as demonstrated in Pic 4.
2. Test the two pins for readings: 3.2V~3.3V.

- **Output voltage test**

1. Place one probe on **any GND pin** and the other on the **24V pin** as shown in Pic 4.
2. Check if the readings are around 24V.



Pic 4. Pins for pulse signal and output voltage test



## 2. The Laser Module Isn't Installed Properly for xTool S1

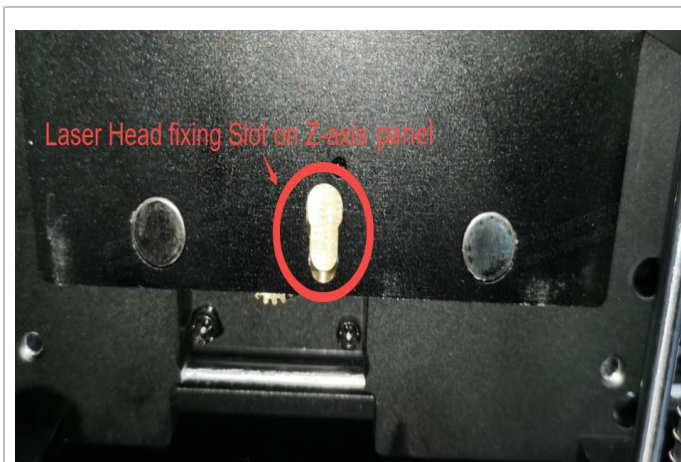
*This article applies to*

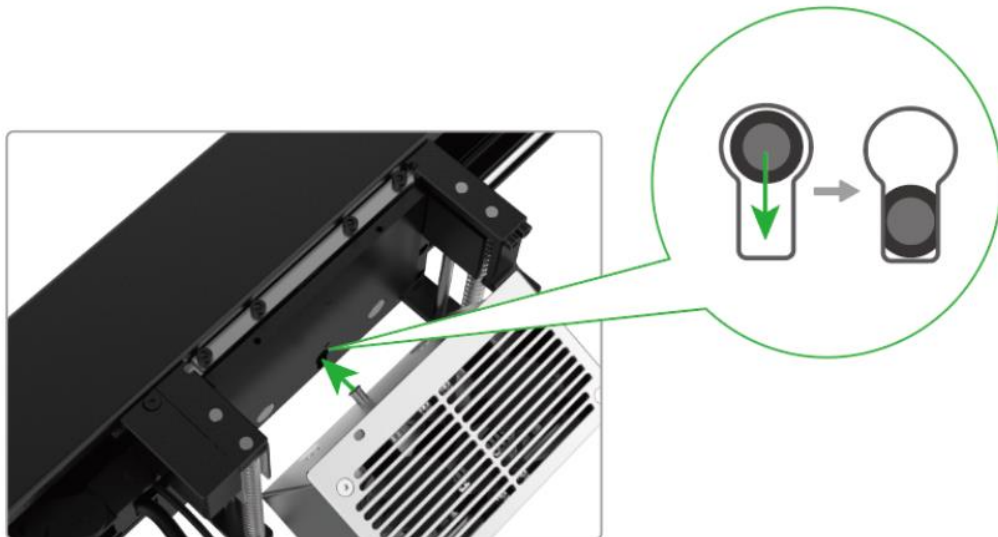
*S1 with all laser modules.*

Make sure the laser module is installed and fixed properly before every usage. Otherwise, exceptions may occur during processing. This guide lists the issues that may occur if the module is not installed properly, and what you can do to check the installation.

### #1 Check the Fixing Structure of the Laser Module

Make sure the fixing structure of the laser module is fitted into the fixing slot of the Z-axis panel.



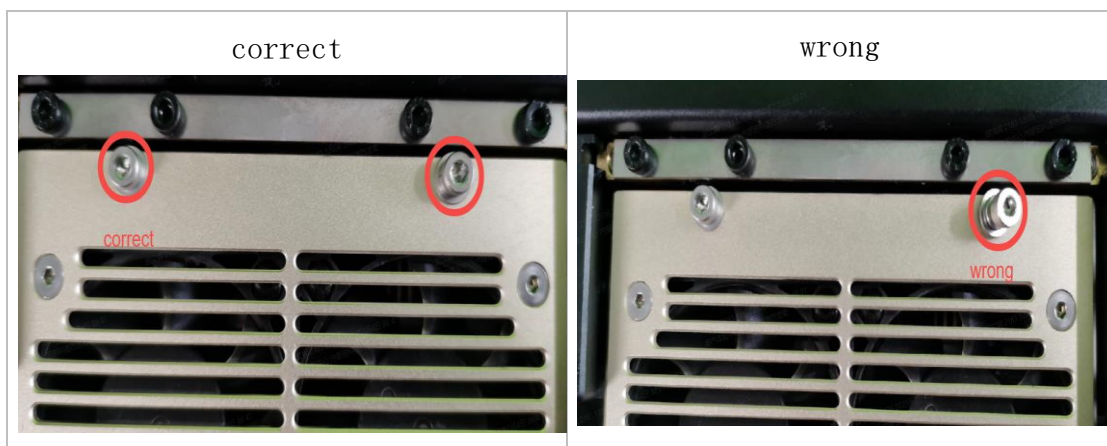


## #2 Check the Fixing Screw of the Laser Module

Make sure the fixing screw is inserted vertically into the laser module surface.

### Related Issues

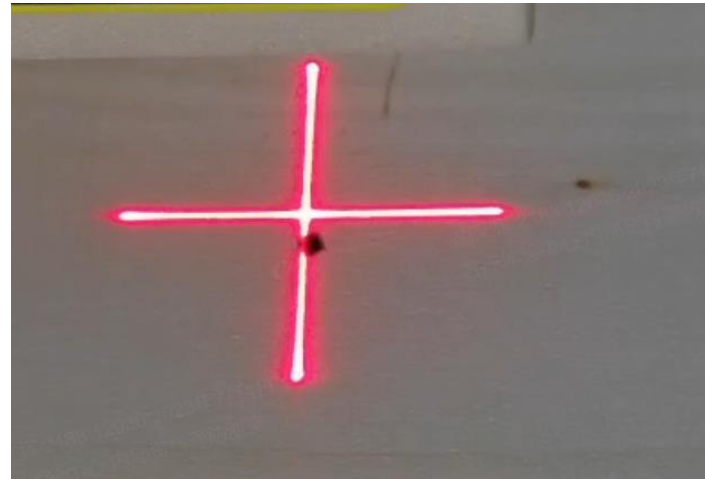
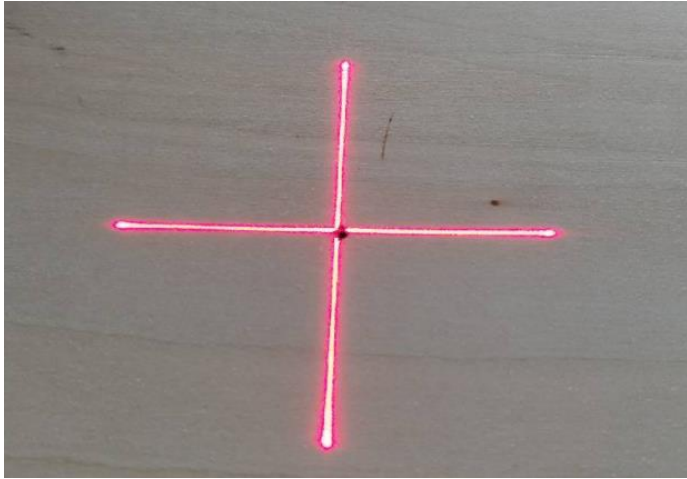
#### 1. The Red Cross Shifts During the Module's Lowering



- Before the framing starts, the laser module will lower itself for the sensor to measure the distance.



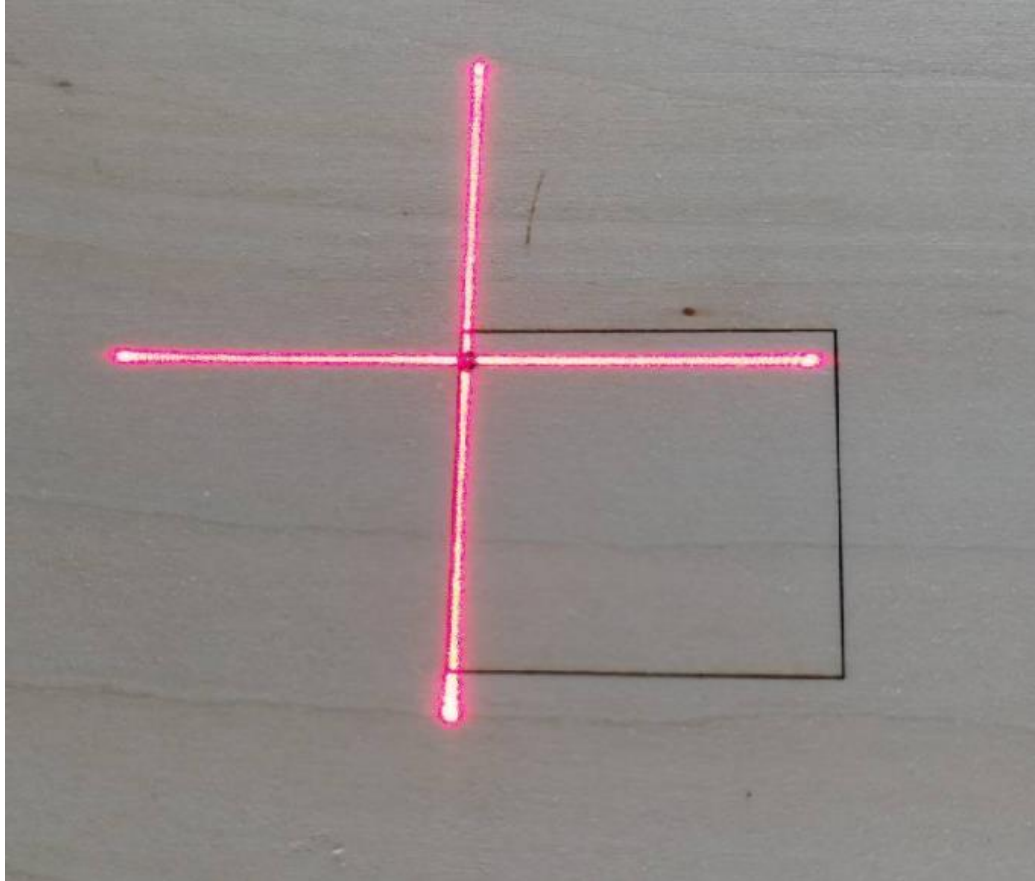
- Normally, the Red Cross should stay at a relatively fixed position during the lowering. There could be a shift of position no more than 0.5mm in distance.
- However, if the laser module is not installed properly, the shift can be obvious.



## 2. The Positioning Point Shifts from the Processing Starting Point

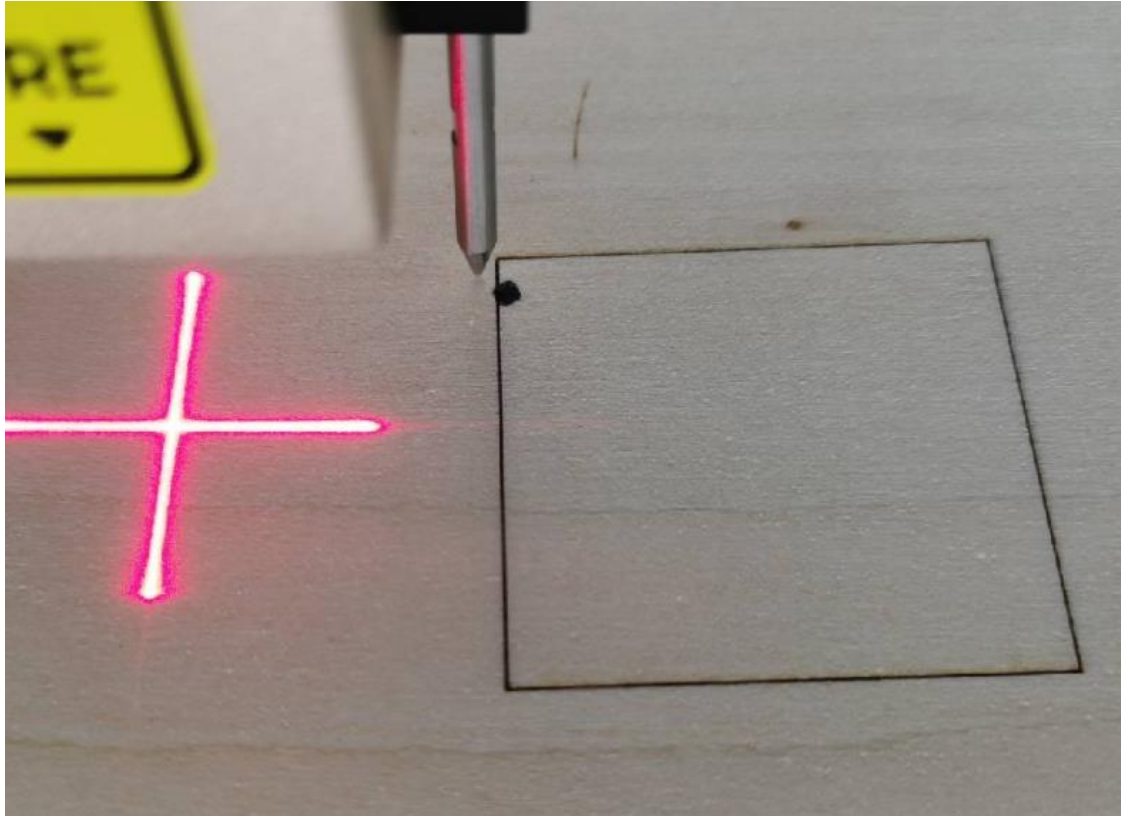
Normally, the starting point of the processing should be exactly the same as indicated by the red cross.

However, if the laser module is not installed properly, the red cross may shift from the actual starting point.



### 3. The Detection Point of the Distance Sensor Offsets

- The Positioning Point Shifts from the Probe's Contact Point
- The black point is the center of the red cross light beams, which is the detection point of the distance sensor
- If the laser module is not installed properly, the center of the red cross light beams offsets from the detection point of the distance sensor.



#### 4. The Probe of the Distance Sensor Won't Be Reset Manually

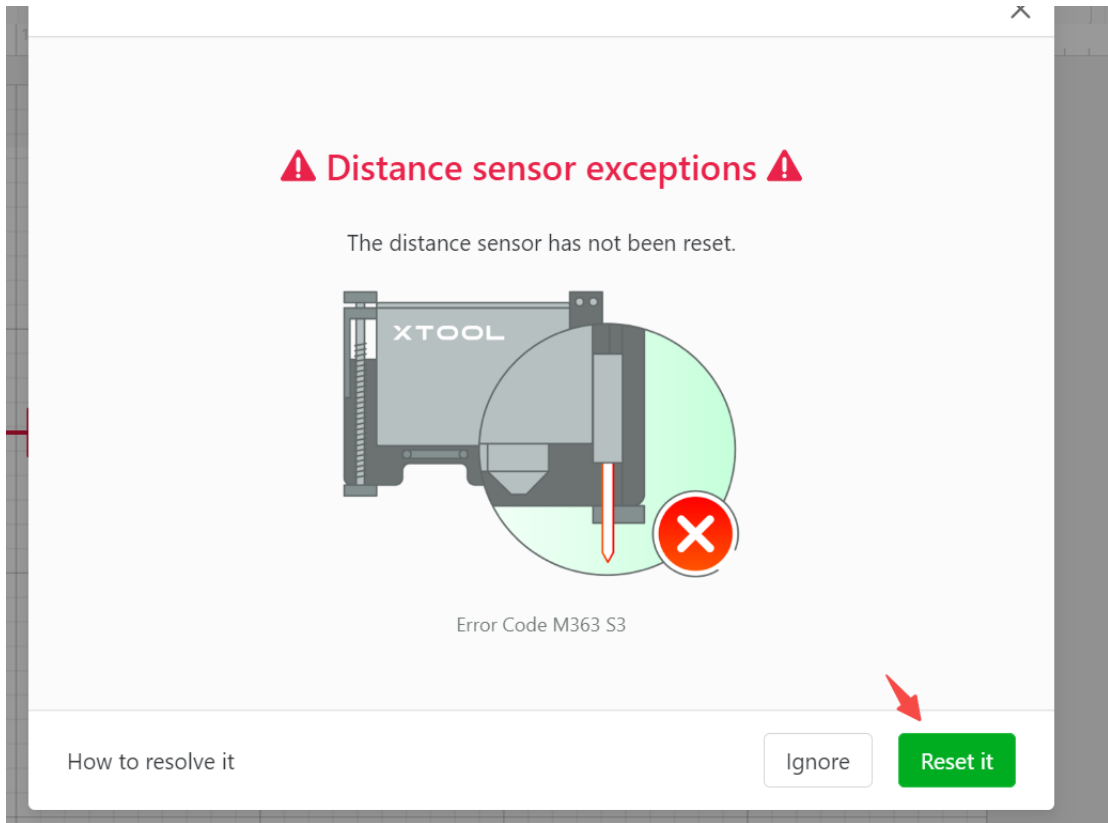
After the probe is triggered, you can manually reset the probe.

- If the laser module is not installed properly, the probe won't be reset no matter how hard you try.
- If you persist, the probe will be inclined.

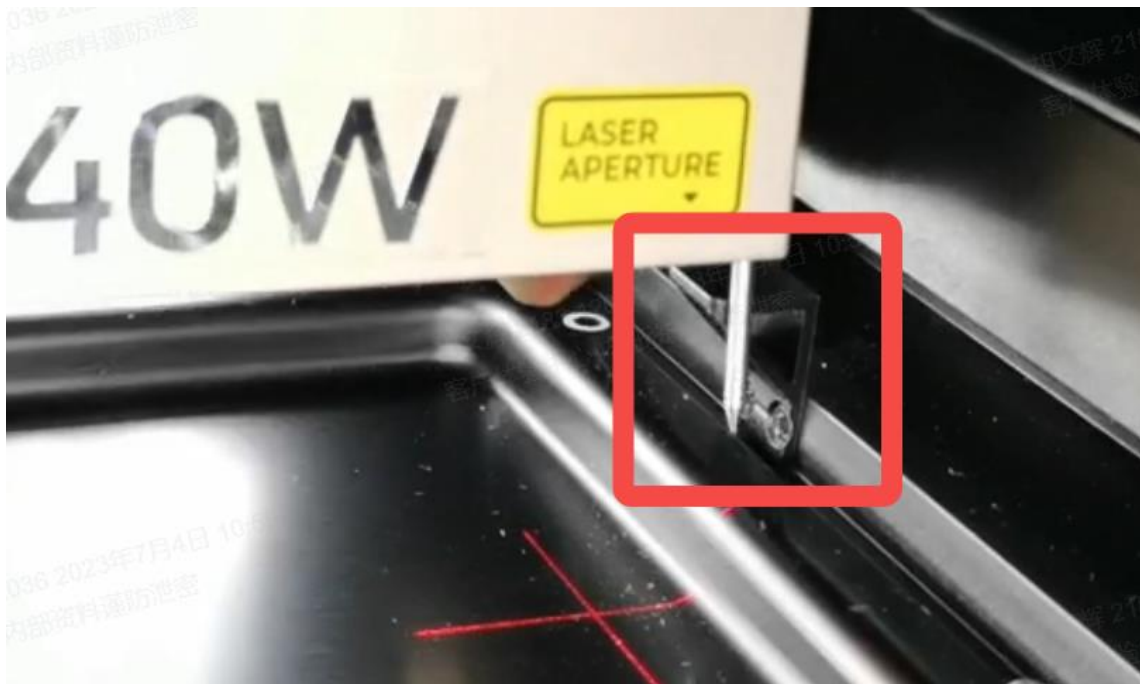


## 5. The Probe of the Distance Sensor Won't Reset Automatically

- After the probe of the distance sensor is triggered, click "Framing" or "Auto-Focusing", XCS detects the probe has not been reset.
- Click "Reset it", and the laser module automatically moves to the reset stand in the top right corner, and the probe resets.



- If the laser module is not installed properly, the probe won't go back to its original position.
- The distance sensor may get hit and drop off.



- If other issues occur, please contact Customer Support for further advice.

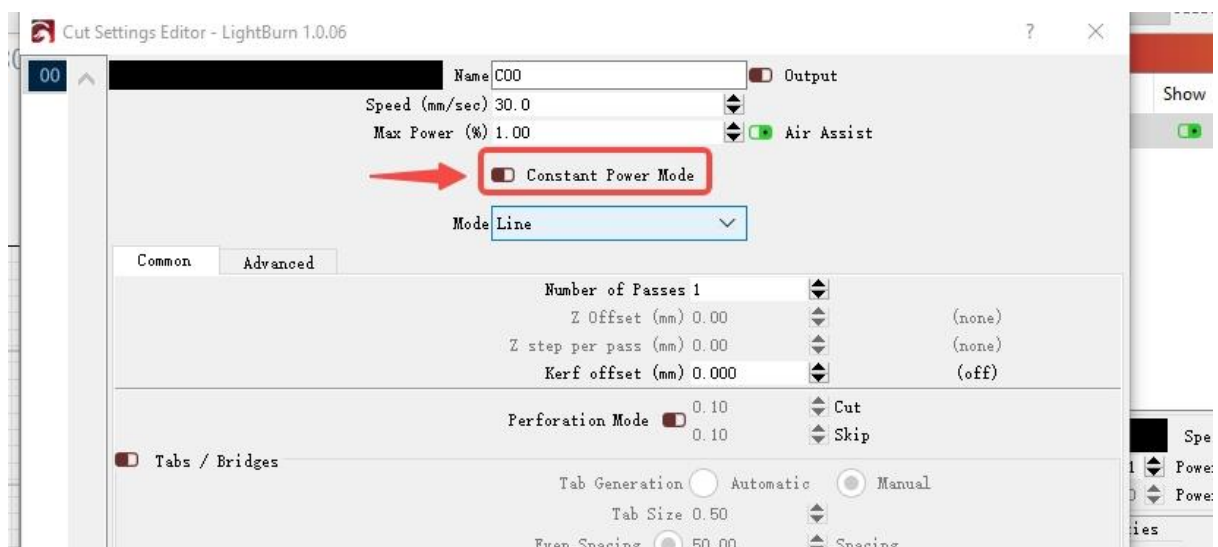


# 3. FAQs on the Infrared Laser Module for xTool S1

## 1. Why is the engraved Image not good for the S1 infrared laser module?

### Possible Causes

1. Check if the laser is focused properly according to the instructions below.
  1. If the laser is focused properly, you will see a white laser spot on the surface of the processing material and hear a sound during processing.
  2. The effective focal depth for the infrared laser module is 3.6mm. Theoretically, you can see a white laser spot when the processing depth is limited to 3.6mm. The brighter the white laser spot is, the more properly the laser is focused.
1. Try a higher lines-per-cm value in XCS or a higher lines-per-inch value in LightBurn.
2. Check LightBurn settings.
  - When you engrave with a bitmap image, "Constant Power Mode" should be disabled.
  - For vector engraving, "Constant Power Mode" should be enabled.



1. Check if the processing parameters are set properly according to the material.



## 2. Why is the engraved image unclear?

The laser spot size for the infrared laser module is 0.03mm × 0.03mm, so its engraving traces are very slim.

If the engraved image has a lower resolution, try a higher lines-per-cm value in XCS or a higher lines-per-inch value in LightBurn.

## 3. Why won't the IR module focus the laser properly?

The focus depth of the infrared laser module is 3.6mm, which makes it harder to focus the laser module on the processing material.

Before focusing, make sure the processing material surface is flat and the auto-focus function of S1 is properly enabled.

Note: Before engraving on precious metals, it's recommended to measure the focal length on other metals.

## 4. How to confirm if the laser is focused properly?

If the laser is focused properly, you will see a white laser spot on the surface of the processing material and hear a sound during processing.

The effective focal depth for the infrared laser module is 3.6mm. Theoretically, you can see a white laser spot when the processing depth is limited to 3.6mm. The brighter the white laser spot is, the more properly the laser is focused.



## 5. What is the actual output power of the infrared laser module?

The infrared laser module uses laser pumping for the delivery of pulsed laser, and the average output power value is higher than 2W.

The difference between the pulsed laser and the 455nm blue laser: the maximum power value of the pulsed laser could reach 15KW, which allows the infrared laser to process any metals.

## 6. What influence will the working temperature have on the infrared laser module?

The working temperature of the infrared laser module is -10°C~+30°C (14°F~86°F).

If the temperature is below this range, preheating is recommended by running a project first.

Please refer to the table below for proper preheat time for stable laser output.

| Surrounding Temperature   | Preheat Time Requirement |
|---------------------------|--------------------------|
| -10° C~0° C (14° F~32° F) | 120s                     |
| 0° C~10° C (32° F~50° F)  | 70s                      |
| 10° C (50° F)             | 7s~8s                    |

If the temperature is too low, the device will preheat itself when it is turned on.



## 7. Can the infrared laser module be used to cut the plastics?

No, it can't. It's not recommended to cut any material including the metal with the infrared laser module.

## 8. Which one is better for engraving the stainless steel, the 2W infrared laser module or the 20W blue laser module?

With a 100% power value, the engraving depth of both laser modules is about the same.

However, the blue laser can't engrave gold, silver, or aluminum (raw or silver), while the infrared laser can engrave on any metal and you don't need to apply paint or laser engraving marking paper to the metal.

## 9. The infrared laser module is only 2W in power, but it can still engrave metal. Why?

Although the average power of the infrared laser module is 2W, its peak power can be as high as 15KW.

It can achieve the same result as a 20W blue laser module engraving on stainless steel at 100% processing power. It can also engrave gold, silver, or aluminum (raw or silver) which the 20W blue laser can't.



## 10. What material can the infrared laser engrave?

The infrared laser module can engrave almost all metal, leather, non-transparent plastics, non-transparent black acrylic, stone, glass (with laser engraving marking paper), ceramics (with laser engraving marking paper), and circuit board.

Specifically, for metal, it can work on gold, silver, platinum, aluminum, copper, zinc, titanium, iron, stainless steel, metal oxides, and alloy metals

## 11. Can the infrared laser module cut or engrave transparent acrylic?

No, it can't cut or engrave transparent acrylic, but it can engrave non-transparent black acrylic.

## 12. Can the infrared laser module cut metal?

It can cut 0.05mm aluminum, stainless steel, and copper. However, it's not recommended to cut metal for a long time. Cutting metal will produce a large amount of heat, which may cause damage to the machine parts.

## 13. What is the maximum depth for the infrared laser module?

About 0.05mm.

## 14. Can I do color engraving on metal using the infrared laser module?

No. Only blue laser can have that effect on stainless steel and titanium.



## 15. Is the infrared laser module hot-swappable?

No. You'll have to change the laser module when the machine is powered off.

## 16. Why can't I get a perfect engraving on black acrylics?

Please check if the black acrylic meets the conditions below.

- The acrylic should be opaque.

The laser will pass through transparent (or semi-transparent) acrylics.

- Cast acrylics are recommended instead of extruded acrylics.

According to our lab, cast acrylics usually give the best engraving results.

Therefore, it's recommended to engrave on a cast acrylic that's black and opaque.

## 17. Why won't flame detection work with the infrared laser module?

Since the infrared laser triggers a false alarm of flame detection, the detection will be disabled by the system during infrared lasering.



# 4. xTool S1 Fails to Recognize the Laser Module

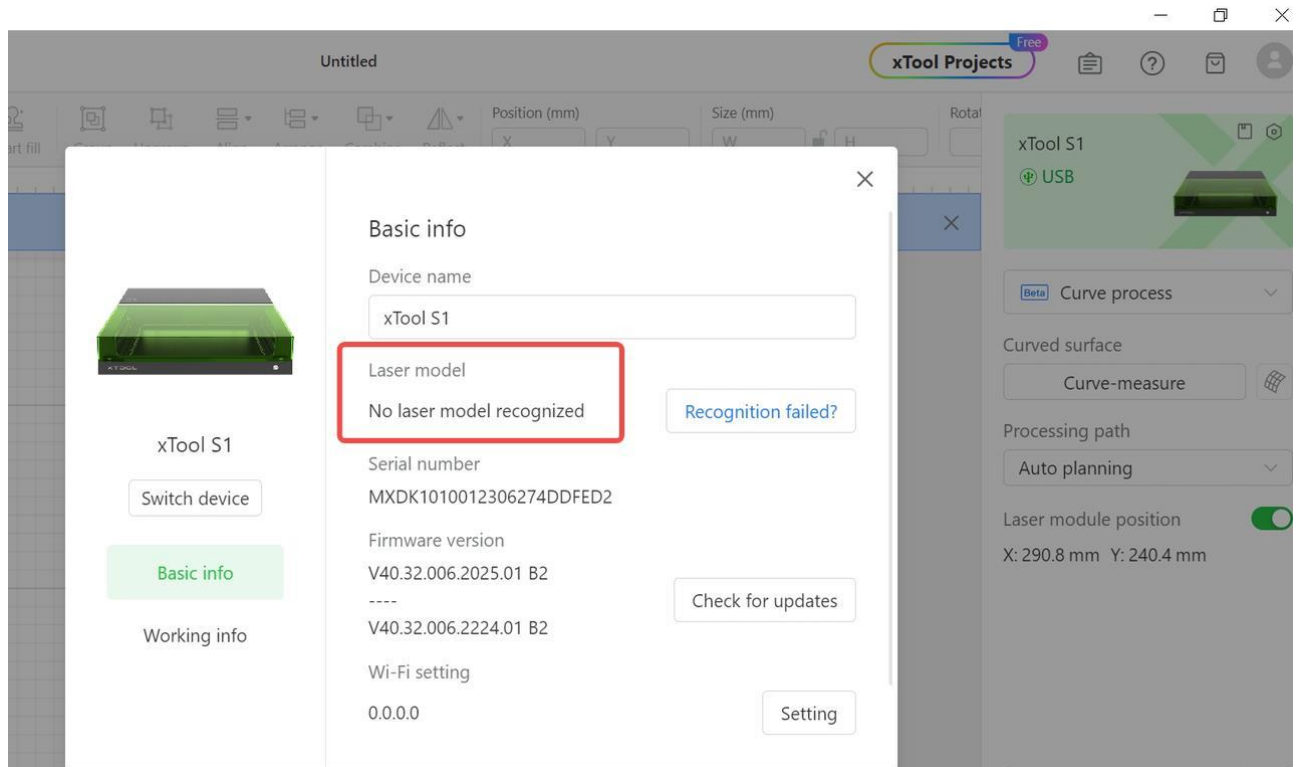
This article applies to:

xTool S1 with all laser modules.

## Issue Description

When connecting xTool S1 with XCS, you may find that XCS won't recognize the model of the laser module.

When this issue occurs, follow this guide for troubleshooting.



## #1 Upgrade the Firmware

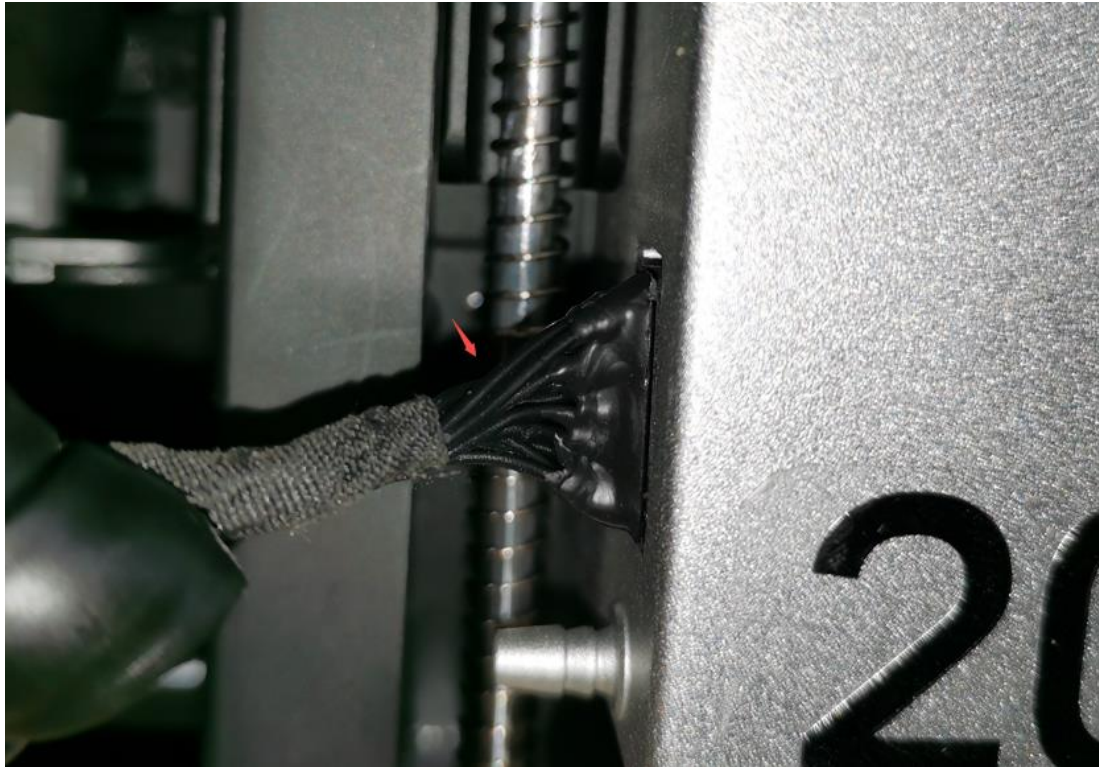
Check and upgrade the firmware of S1 to the latest version. See [this guide](#) for details.



## #2 Check the Connection Cable

When processing, the cable connecting to the laser module may become loose.

Power off the machine. Unplug and replug the cable to make sure of a secured connection.



## #3 Check the Port of the Laser Module

Check if the pins of the port on the laser module are deformed or damaged.

Check if there is any sign of breakage on the connection cable of the laser module.





# 5. The Laser Module of xTool S1 Falls Off the Rails or Won't Move Smoothly

*This content applies to:  
xTool S1 with all laser modules.*

## Video Guide

<https://youtu.be/SfX9SKuOh08>

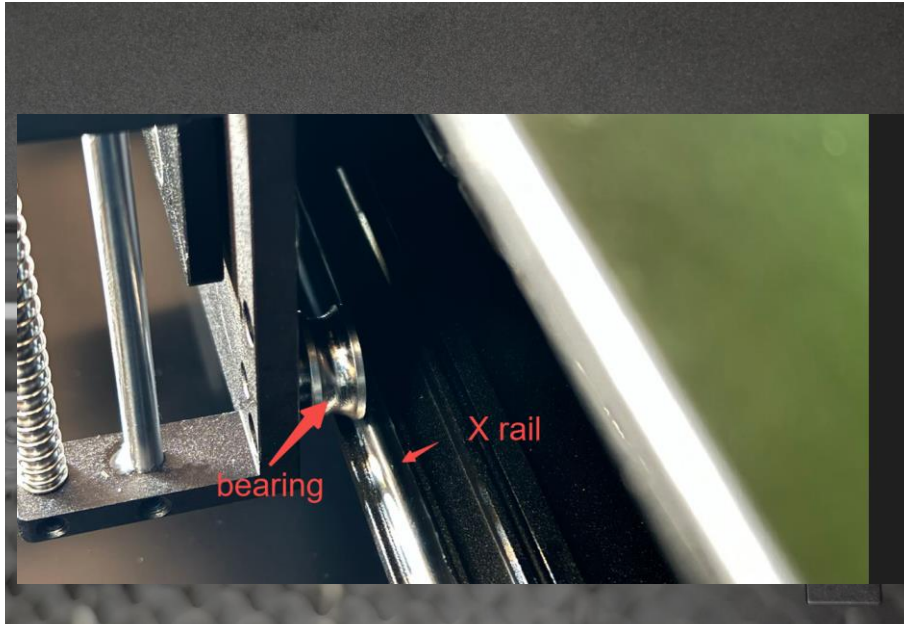
## Issue Description

During the operation of the machine, you may hear unusual sound from the X-axis gantry. Or, you may find the laser module difficult to move when the machine is power off.

## Solution

### #1 Adjust the U-Shaped Bearings

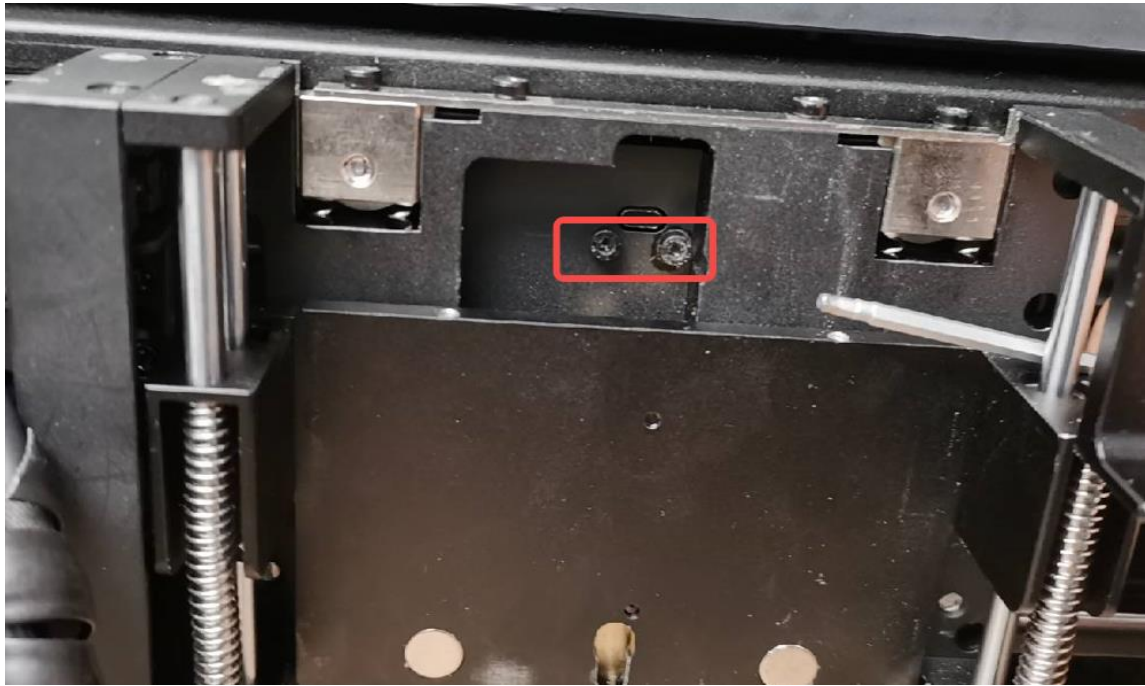
1. Power off the machine. See if the laser module carriage is popped out



2. Check if any of the bearings has fallen off the rails. If so, put the bearings back on the rails.

## #2 Check the Belt Fastening Piece

1. Take off the laser module, press down the movable plate.



2. Detach the fastening piece from the carriage.
3. Move the carriage left and right a couple of times. See if it moves smoothly.
4. Move the belt fastening piece in the same way. See if it moves smoothly.



5. Check the fastening piece for any deformation.



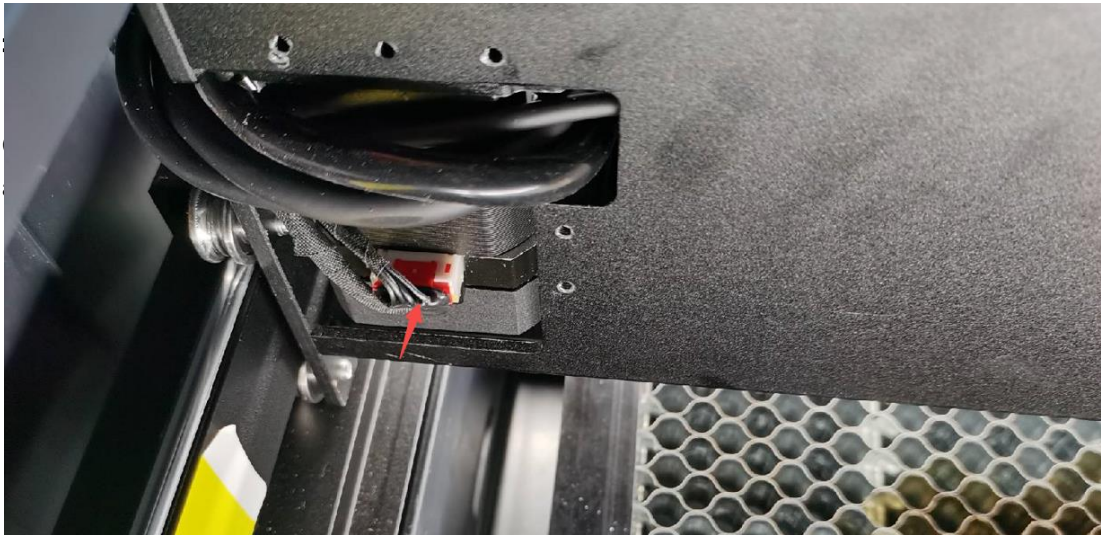
### #3 Check the X-Axis Motor Cables

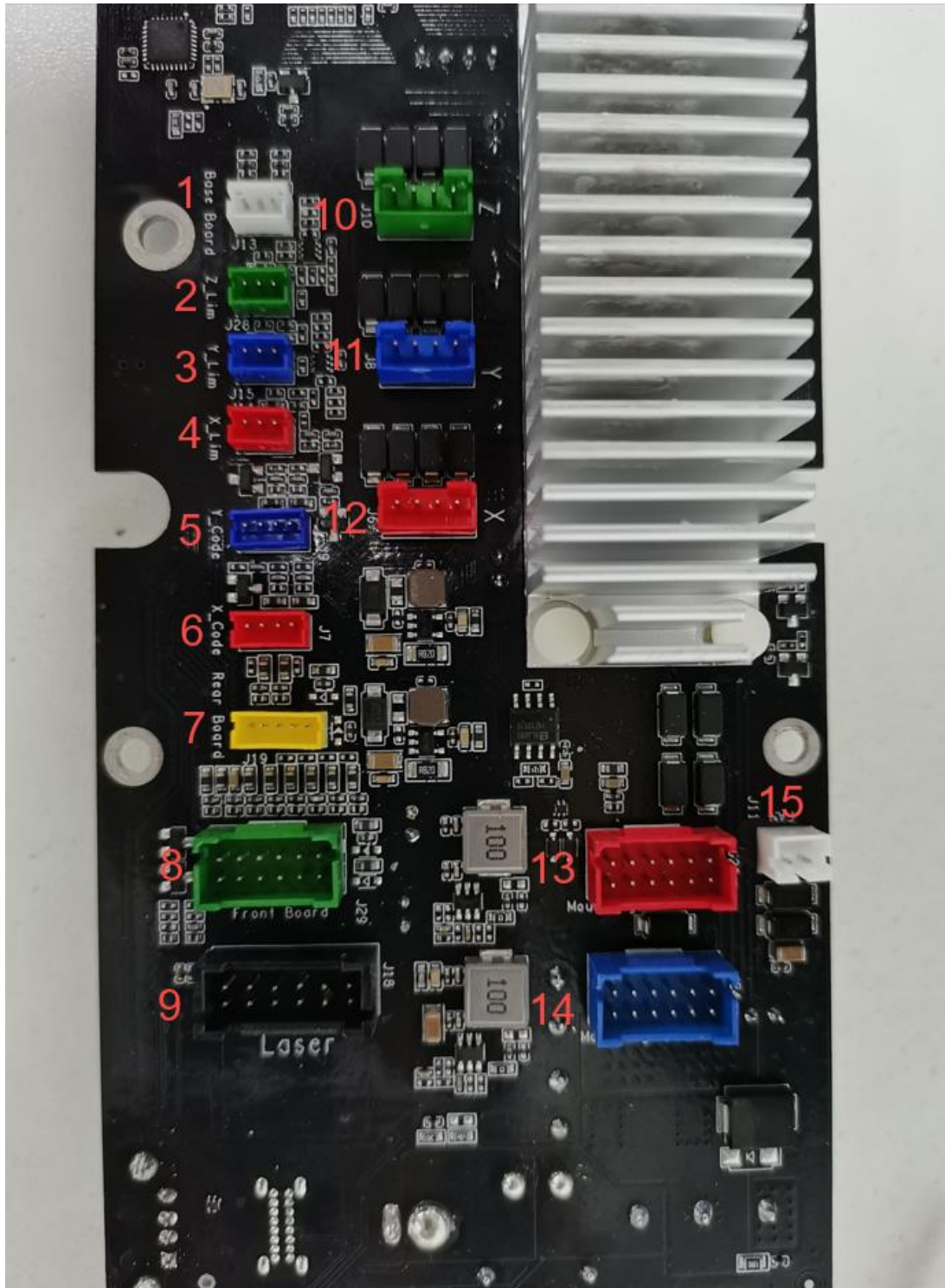
1. Power off the machine. Find the motor protective cover at the back of the X-gantry and remove the four screws.





2. Check the cables for any breakage or unusual bent. Unplug and replug the cables.







# 6. Troubleshooting XCS Error Codes for xTool S1

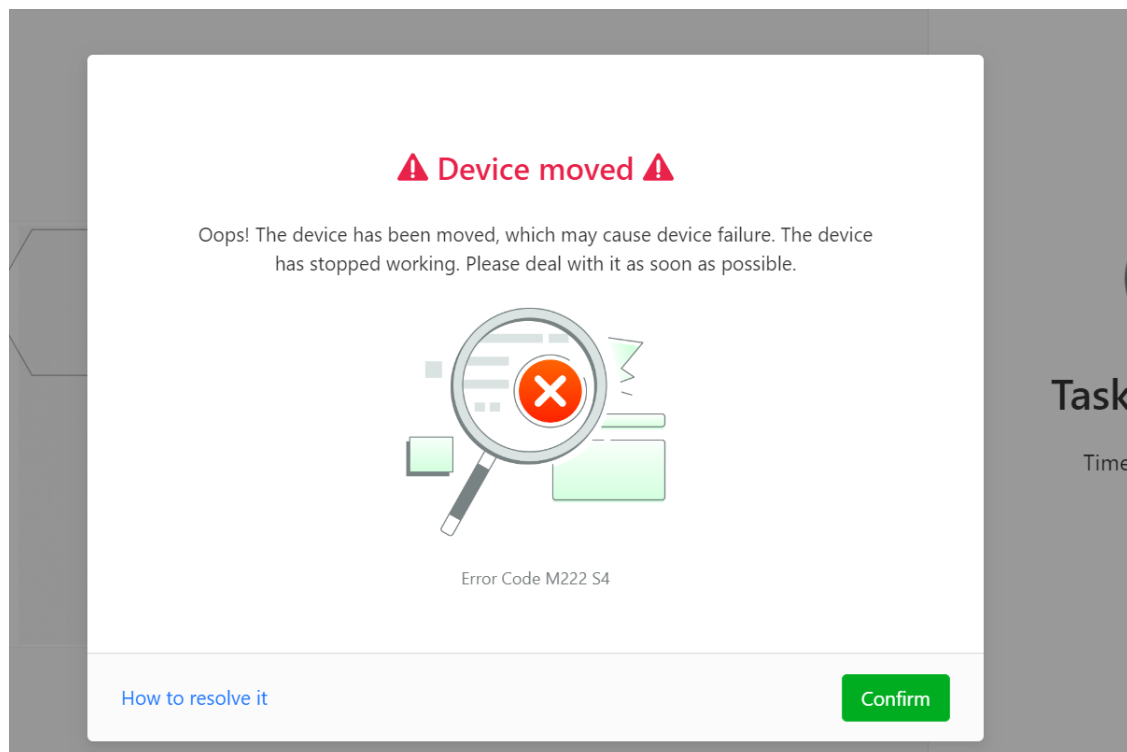
*This article applies to:  
xTool S1 with all laser modules.*

## About This Guide

When you are using the machine, the XCS software may report different types of error messages that can cause the machine to stop processing mid-job. Please refer to this guide for advice.

Note: When the processing is paused, you can resume it by pressing the Button on the machine.

## Error Code M222 S4: Device moved

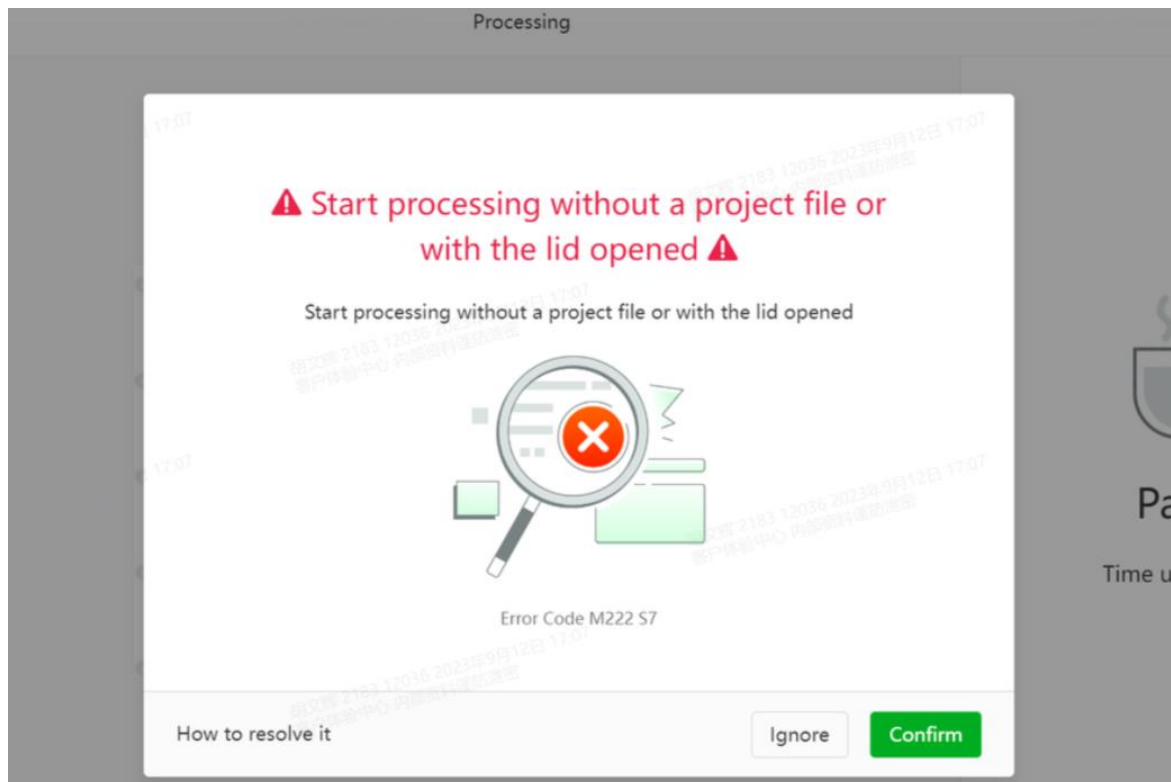


- This error is triggered if the machine is suddenly moved or lifted while it is processing.



- Please place the machine on a level surface to avoid bumps and tilts during processing and make sure that the machine is not lifted and moved at the time.
- Please also ensure that your machine's firmware is upgraded to the latest.

## Error Code m222\_s7: Start processing without a project file or with the lid opened




- This error is triggered if the lid is not closed when the machine is processing, or if it's jammed by a foreign object so that it can not be fully closed. Please check and make sure that the lid is closed and that the firmware version of the machine has been upgraded to the latest.
- If the error code persists when the lid is closed properly and the firmware has been upgraded, the internal Hall sensor may be faulty. Please contact customer support for further advice.



## Error Code m53\_t0: SD card exceptions or failure

**⚠ SD card exceptions or failure ⚠**

SD card exceptions or failure



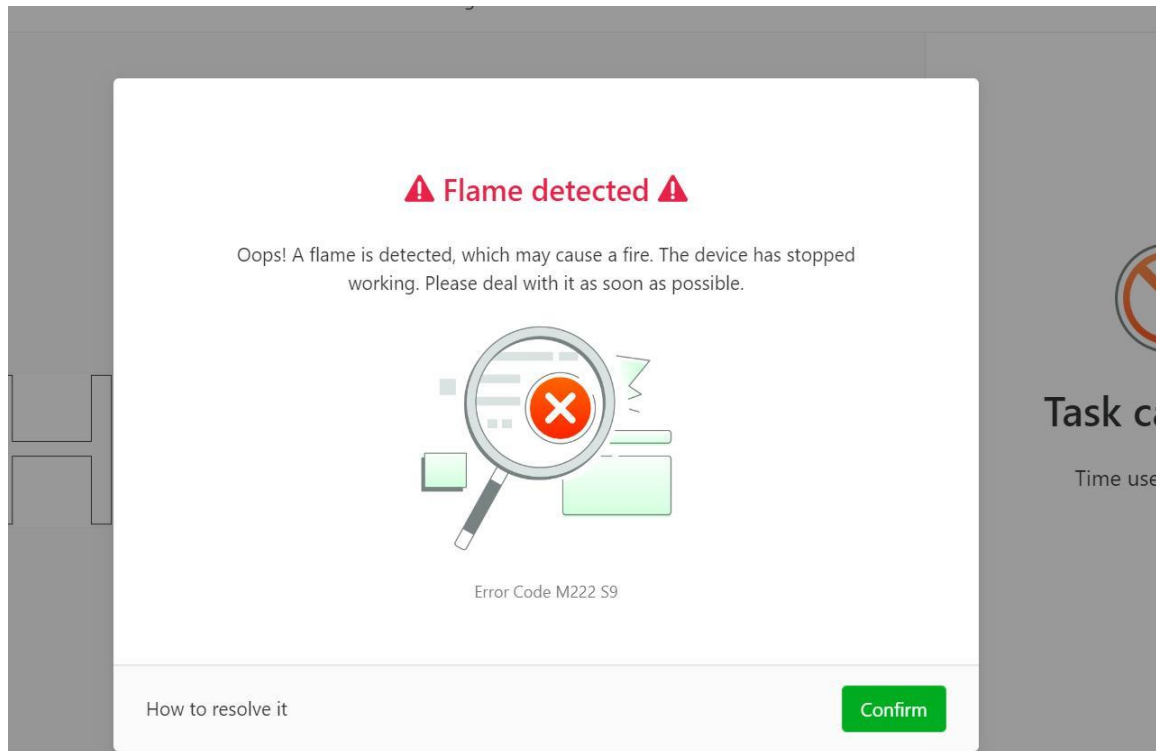
Error Code M53 T0

[How to resolve it](#) Confirm

- This error is triggered most likely because the SD card is moved or unplugged when the machine is powered on, which can prevent the XCS processing file from being sent to the machine's TF card.
- Please try powering down the machine and then replugging the SD card. If the problem persists, please try with a different SD card.



## Error Code m222\_s9: Flame detected



- If you get this error when using the blue diode laser, it means that the machine has detected a flame during processing. Please check the condition of the machine immediately and extinguish the flame.
- In some cases, certain materials may catch fire during processing. According to tests, the flammability of materials, in descending order, is as follows: corrugated cardboard > balsa wood > basswood board > pine wood > leather > acrylic > kraft paper.
- After checking the machine, if no fire is found, check if the 1064nm infrared laser module is used.
- The wavelength of this infrared laser is similar to the detection wavelength of the flame sensor and can cause false alarms for flame detection.


Caution: DO NOT leave the machine unattended during processing. Use it with a fire safety set if possible.



## Error Code m222\_s20: The device reached position limits during processing

**⚠ The device reached position limits during processing ⚠**

The device reached position limits during processing



Error Code M222 S20

[How to resolve it](#)[Confirm](#)

- If this error message appears, it means that the position limit function has been triggered. Since the XCS software uses absolute coordinates for positioning, the position limit function will be triggered if the size of the design file is out of the canvas range. Normally, using the machine correctly will not cause this problem.
- If the laser module is grinding the edge, enable the laser position display on the XCS software and see if the displayed position matches the actual position. If not, the problem may be due to an issue in the Gcode file generated by XCS. Please try to turn off the computer and unplug the TF card, change the Wi-Fi network, and process again.
- If the problem is still not solved, there may be problems with the limit sensor, limit connecting cable, or motherboard. Please take a video of how the laser module moves during the issue and provide it to us for analysis.



# Error Code m222\_s21: Communication exceptions between the Wi-Fi module and the main controller

## ⚠ Communication exceptions between the Wi-Fi module and the main controller ⚠

Communication exceptions between the Wi-Fi module and the main controller



Error Code M222 S21

How to resolve it

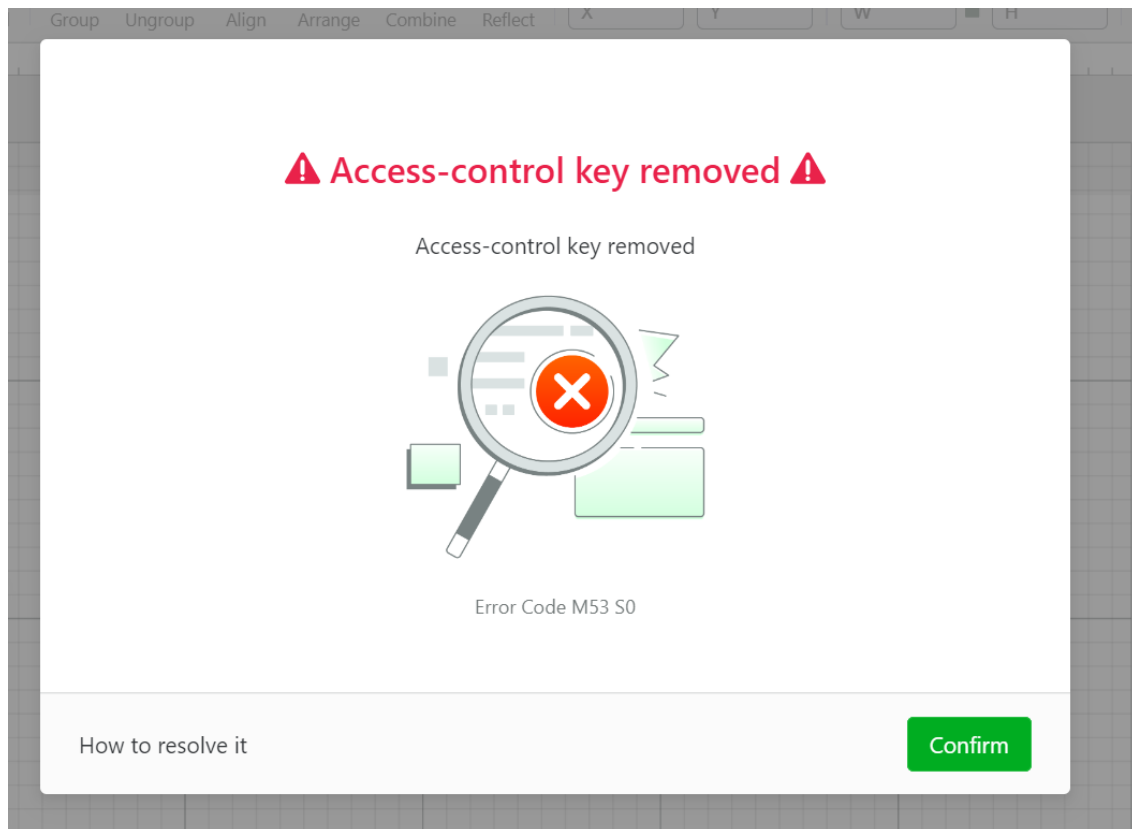
Ignore

Confirm

- If this error is triggered, restart the machine and the XCS software, and upgrade the machine's firmware to the latest version.
- If more than one device is connected to the machine, please keep only one device. If the problem continues, please contact customer support and tell us how often and under what situation this issue happens.



## Error Code m222\_s23: Access-control key removed



- If this error is triggered, the USB security key may be faulty or not properly inserted in the port.
- Ensure your machine's firmware has been upgraded to the latest version, and check that the security key is inserted properly. If the problem persists, turn the machine off, use the spare security key, and turn it back on. If the problem persists, contact customer support.


Note: You can find the spare security key in the toolbox that comes with the machine.



## Error Code m8: Motor driver chip errors

**⚠ Motor driver chip errors ⚠**

Motor driver chip errors



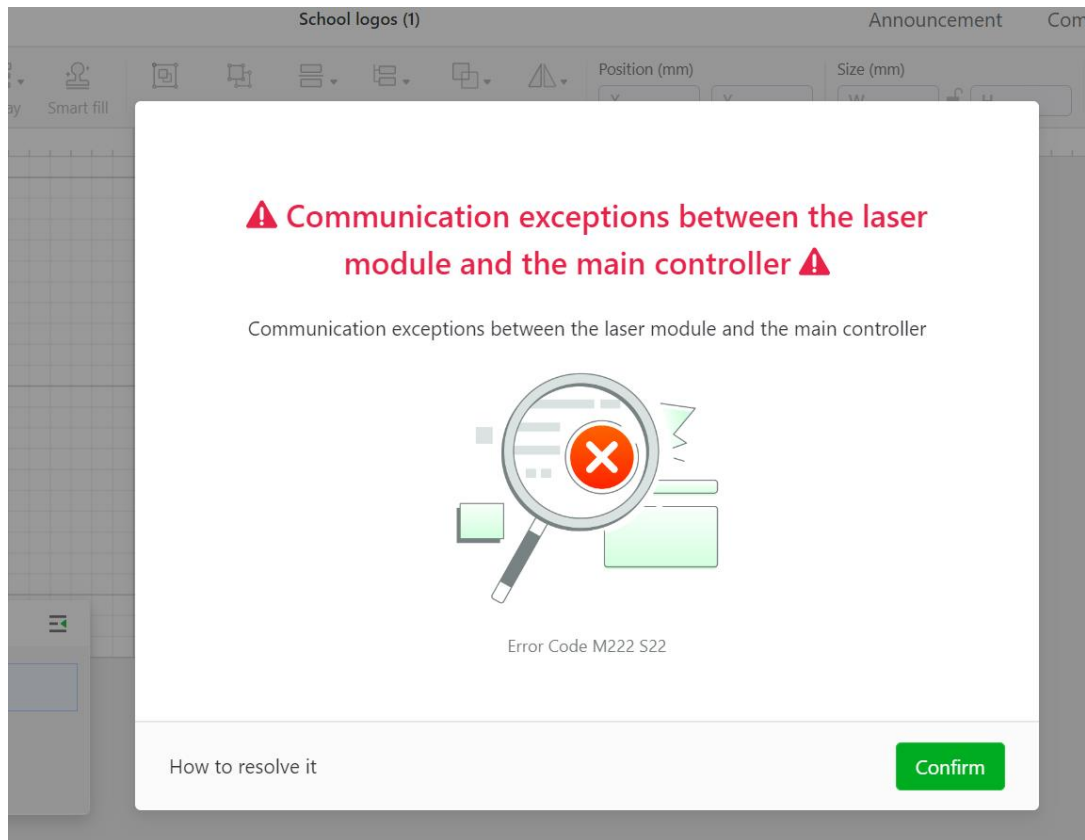
Error Code M8

[How to resolve it](#)[Confirm](#)

- If this error is triggered, it is usually due to an issue of one or more of the X, Y, and Z-axis motors.
- To determine which motor is faulty, add a line in the corresponding direction to the XCS software canvas and run the process. If an error occurs, the motor in that direction may be faulty. Plug and unplug the cable of that motor. If the problem persists, please contact customer support for advice.



## Error Code M222 S22: Communication exceptions between the laser module and the main controller



- If this error is triggered, please refer to this article for further troubleshooting:  
<https://support.xtool.com/article/1072>



# 7. Troubleshoot "Start processing without a project file or with the lid opened"

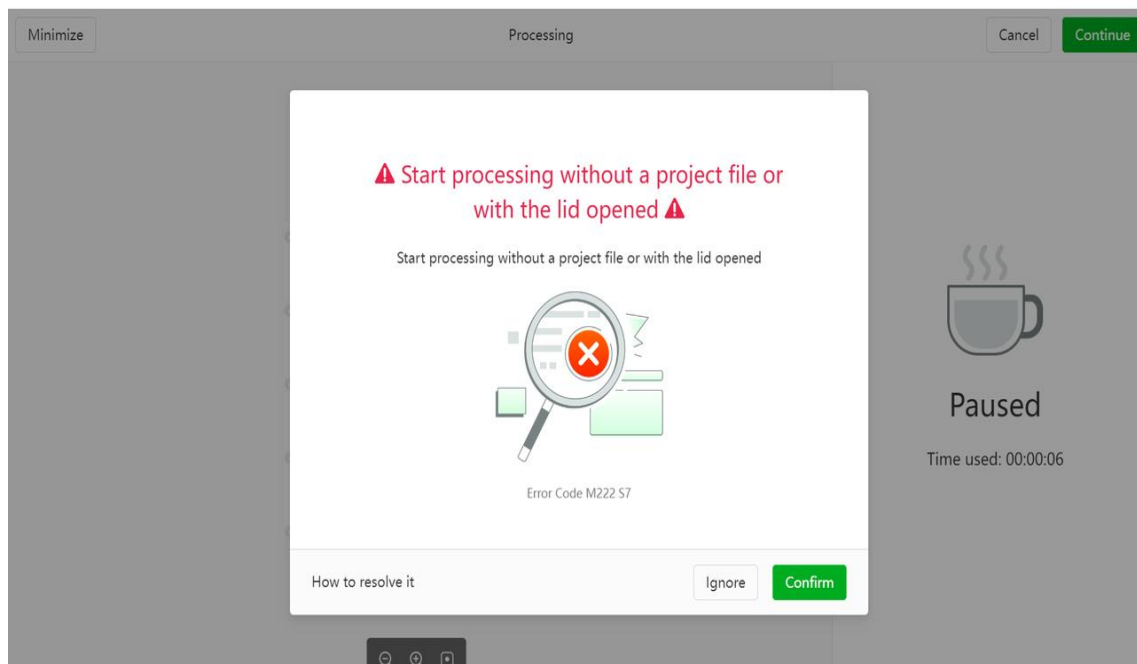
*This article applies to:*

*xTool S1 with all laser modules.*

## Issue Description

To keep your eyes safe from the laser, the machine's top lid must be closed during processing.

If you see XCS shows an error message that says the lid is not closed, please refer to this guide for advice.





## #1 Make sure the lid is closed

- Please check that the machine's top lid is closed properly and that no foreign objects are stuck in it.
- Due to the Hall switch mechanism, the machine can still work with the lid lifted 1-2mm. In this case, please close the lid properly and carry on.

## #2 Upgrade the Firmware

- Please check and upgrade the machine's firmware to the latest version.
- See this step-by-step guide on how to upgrade the firmware:  
<https://support.xtool.com/article/1076>



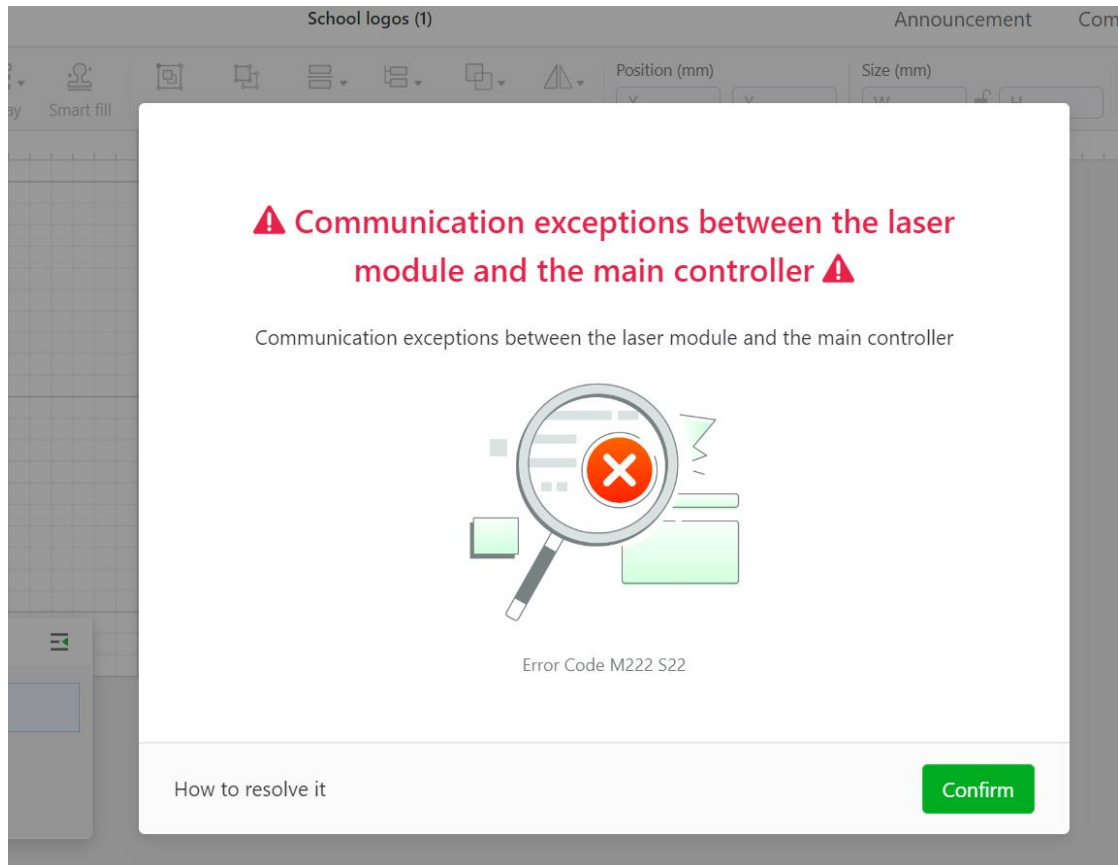
## 8. Troubleshoot "Communication exceptions between the laser module and the main controller" for xTool S1

*This article applies to:*

*S1 with all laser modules.*

### Issue Description

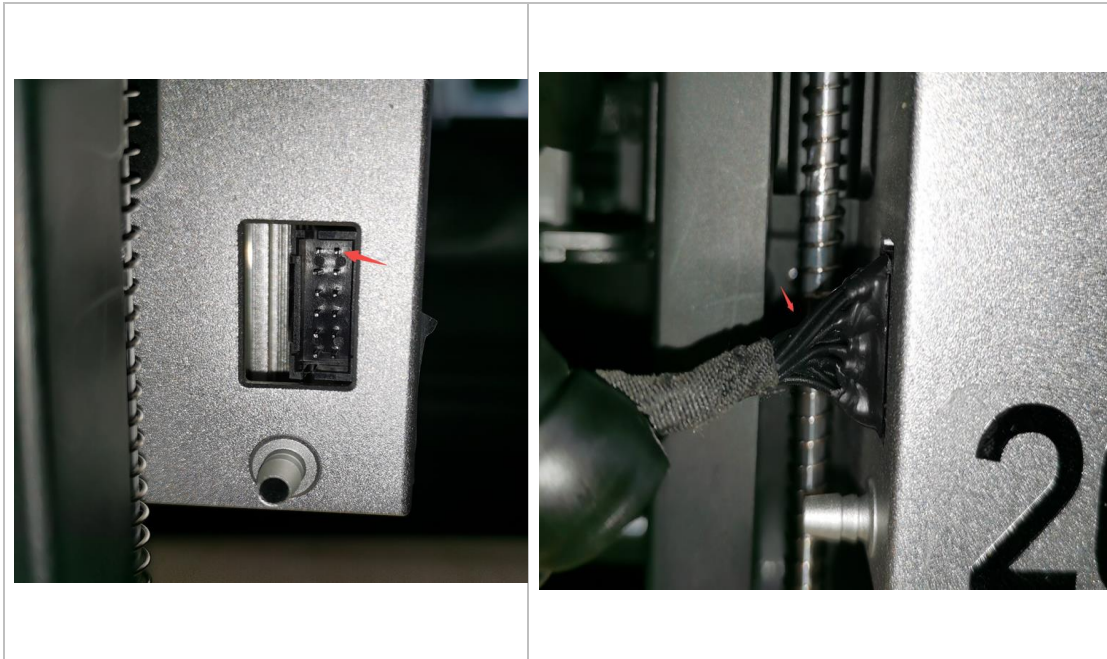
- When using the machine, if you see an error message about laser and controller communication failure on XCS, the main cause is that the connection between the laser head and the main board is suddenly disconnected, preventing the laser head from timely transmitting signals to the main board.
- When this issue occurs, there is a possibility that an error message about distance sensor exception may also appear. If this error message appears, you can try pressing the machine's processing button to continue processing.



- When the machine is processing, you may see the connection cable between the laser module and the holder loose. The communication is therefore getting cut off. It may or may not resume the work after you press the Start button.

## #1 Check the Laser Module Socket

1. Check if the pin in the laser module socket is bent or damaged.
2. Check if the laser module connection cable is damaged.
3. If yes, please contact support@xtool.com for further advice.



## #2 Check the Laser Module Connection

1. Unplug and replug the connection cable into the laser module socket and try again. Avoid any bulge or arch of the cable. It may get caught by the machine and gets damaged.
2. If you get the error message repeatedly, try to fix the connection cable and the laser module with some adhesive tape or glue. Make sure the adhesives are removable. Permanent tape or glue may cause trouble if you want to replace the module in the future.
3. To reduce the risk of loose wires, try to place the processing file in the center of the canvas and reduce the frequency of the laser module traveling a large distance within the processing area.
4. If the above-mentioned procedures won't help, you may need to adjust the wiring of the connection cable according to this video.

Video: [https://youtu.be/JPJLdH6M7\\_Q](https://youtu.be/JPJLdH6M7_Q)



# 9. Troubleshoot "Baseplate or Rise Base Exceptions" for xTool S1

*This article applies to:*

*xTool S1 with all laser modules.*

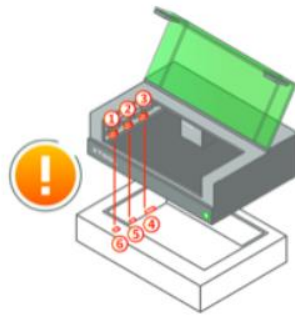
## Issue Description

When this issue happens, you may experience the following:

- A pop-up error message: "Baseplate or riser base exceptions".
- The ring indicator flashes yellow and the alarm is triggered.

### **⚠ Baseplate or riser base exceptions ⚠**

The baseplate or riser base is not properly connected. Click How to resolve it to see how to check and install the baseplate and riser base



Error Code M53 C1

How to resolve it

Confirm



## Possible Cause

The following screws are not installed properly:

- The screws for fixing the baseplate and the machine.
- The screws for fixing the riser base and the machine (if the riser base is used).

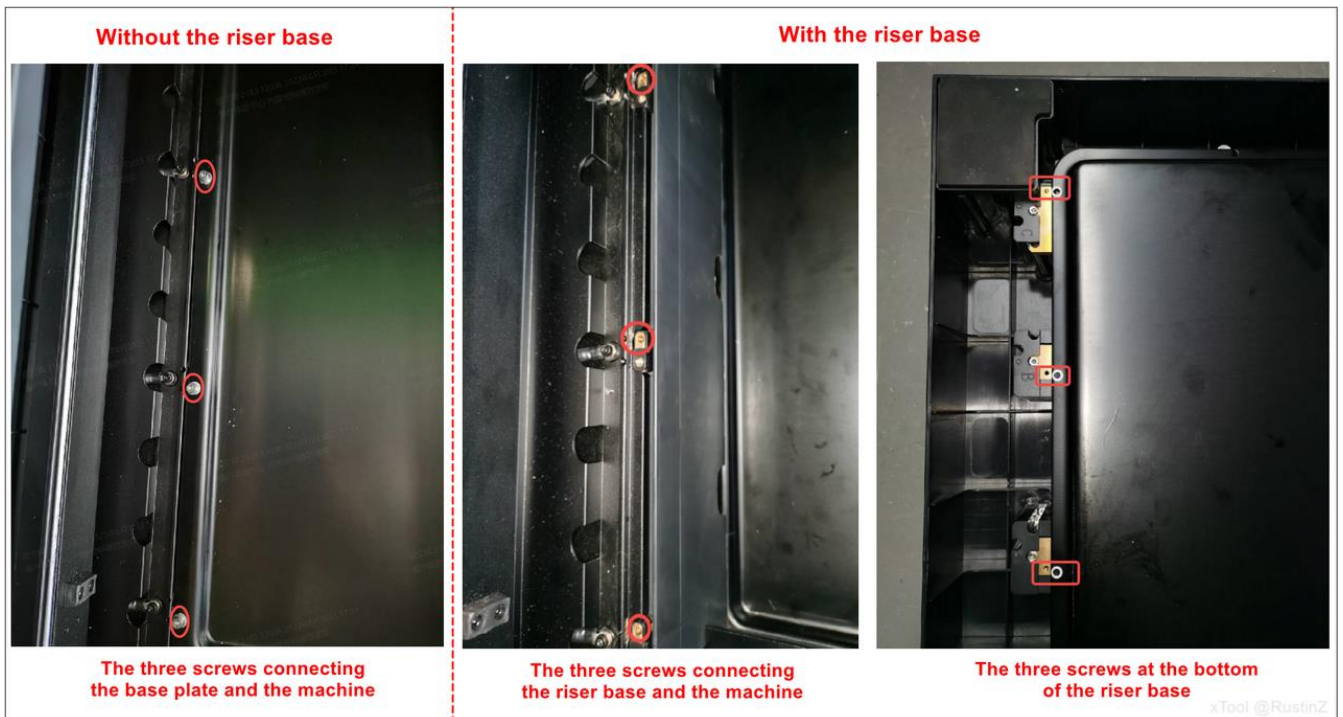
## Solution

For details, you can see this video below:

<https://youtu.be/7AxZC0N6YNw>

You can also refer to the brief steps below:

1. On each side of the baseplate, you should find three screws.
2. Check if the six screws are correct and installed properly.
3. Once the issue is solved, the ring indicator will turn green





# 10. Troubleshoot "Laser Module Overtemperature" for xTool S1

*This article applies to:*

*xTool S1 with 2W infrared laser module.*

## Issue Description

The 2W (Infrared) laser module is designed to have an overtemperature protection mechanism.

When the module gets hotter than **38°C (100°F)** and **40°C (104°F)**, alert messages will show on XCS.

Note: the 10W, 20W, and 40W laser modules of xTool S1 don't have such alerts.

## Solution

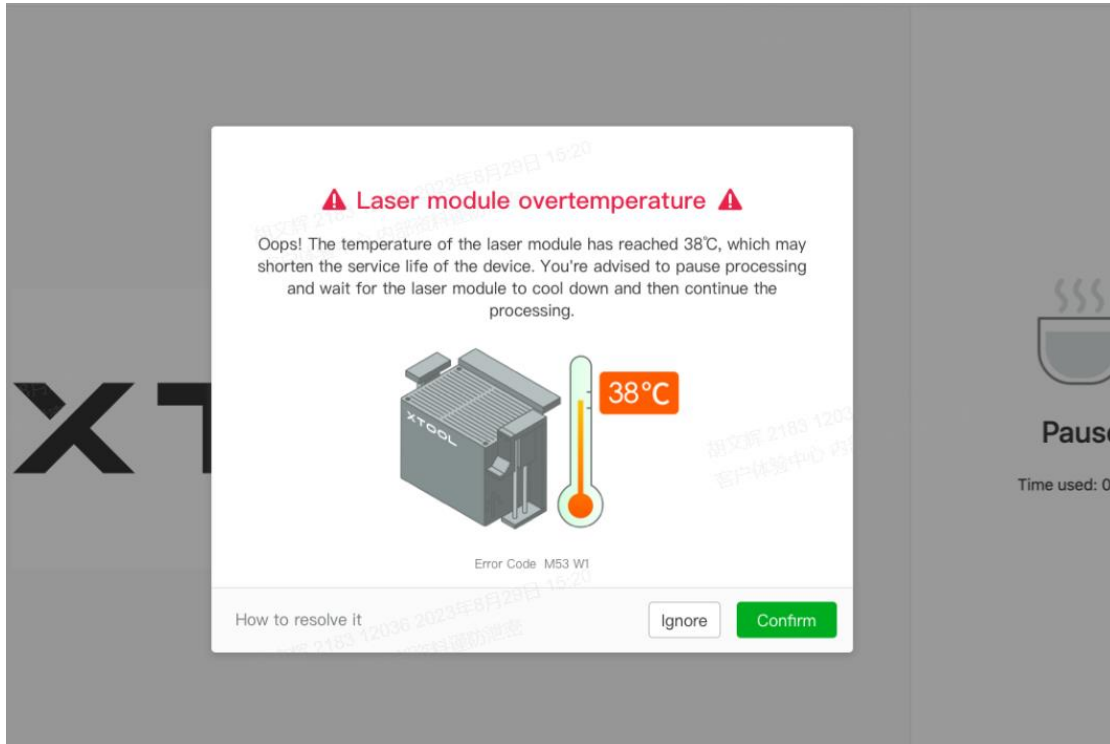
Using the 2W laser module in high temperatures can shorten its lifespan and also affect the power output and processing results. Therefore, when the alert message appears on XCS, we recommend that you wait for the cool-down before resuming your work.

Note: The machine has a "pause and resume" function, so you don't need to worry about wasting your work progress and the material. Simply press the processing button again and the machine will start from where it stopped.

## When the temperature is over 38° C

As this is an early warning, you can continue to work or wait for the machine to cool down.

However, the alarm will keep going during this time, until the temperature gets back to normal.



## When the temperature is over 40° C

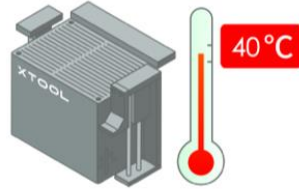
At this point, the system will have to forcefully shut down the machine.

Once the temperature gets back to normal, the machine will be operational again.



**⚠ Laser module overtemperature ⚠**

Oops! The temperature of the laser module has reached 40°C, which may shorten the service life of the device. The processing has been paused. Please wait for the laser module to cool down and then continue the processing.



Error Code: M53 W1

How to resolve it

Ignore

Confirm



# 11. Troubleshoot “Distance Sensor Exceptions” for xTool S1

*This article applies to*

*S1 with all laser modules.*

## Issue Description

When an issue occurs regarding the distance sensor, you are likely to see a pop-up error message on XCS that says "Distance Sensor Exceptions". There are different types of exceptions. We'll need to troubleshoot case by case depending on the error description.

## Things to Check First

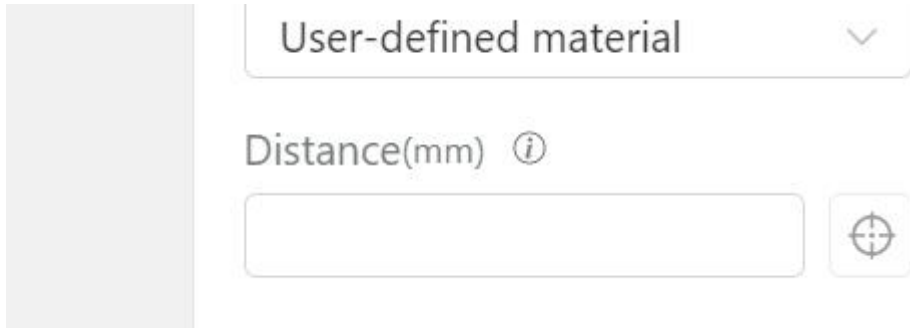
Before troubleshooting, please check the distance sensor probe. Pay attention to the following things.

If any of them is not working as expected, there may be an issue related to it.

1. Before turning on the machine, the distance sensor should be installed and reset. When the machine is turned on, the laser module will move forward in the Z-axis gantry direction, and the distance sensor probe will not be triggered.
2. Before auto-focusing, the probe should be reset. On the right side of XCS, after clicking



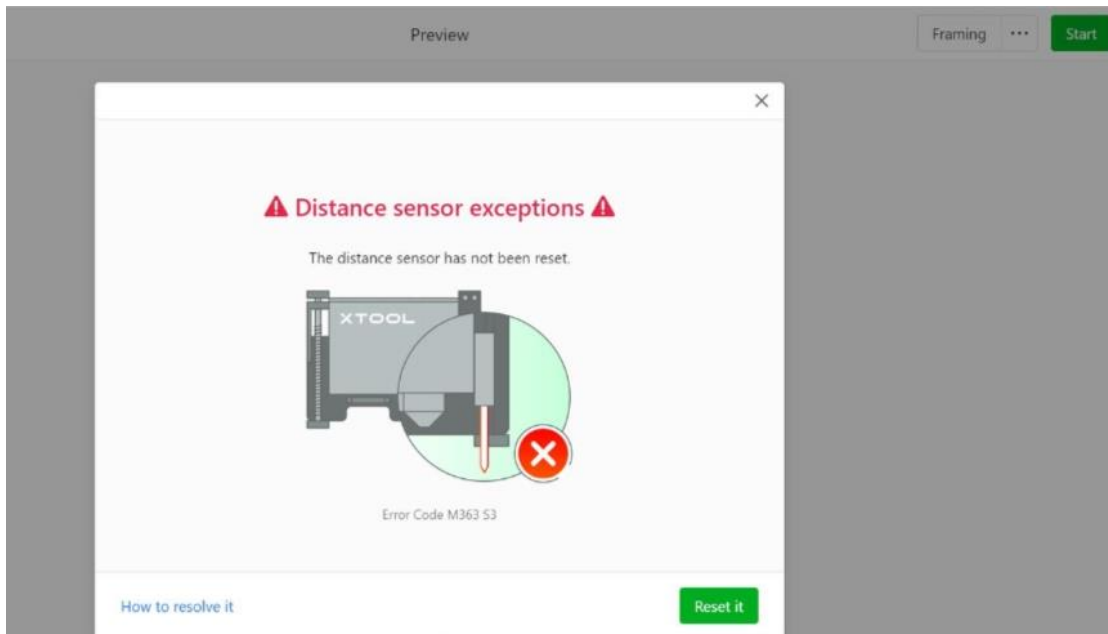
the icon under the **Distance** parameter, the laser module will move forward in the Z-axis gantry direction to trigger the probe, and then the laser module will move downward to measure the **Distance**. After it is complete, the laser module will return to the top right corner and then move downward until it touches the reset platform to reset the probe.



1. Before framing and processing, the probe should be reset. Refer to the pictures below.

## Case 1: The Distance Sensor Has Not Been Reset

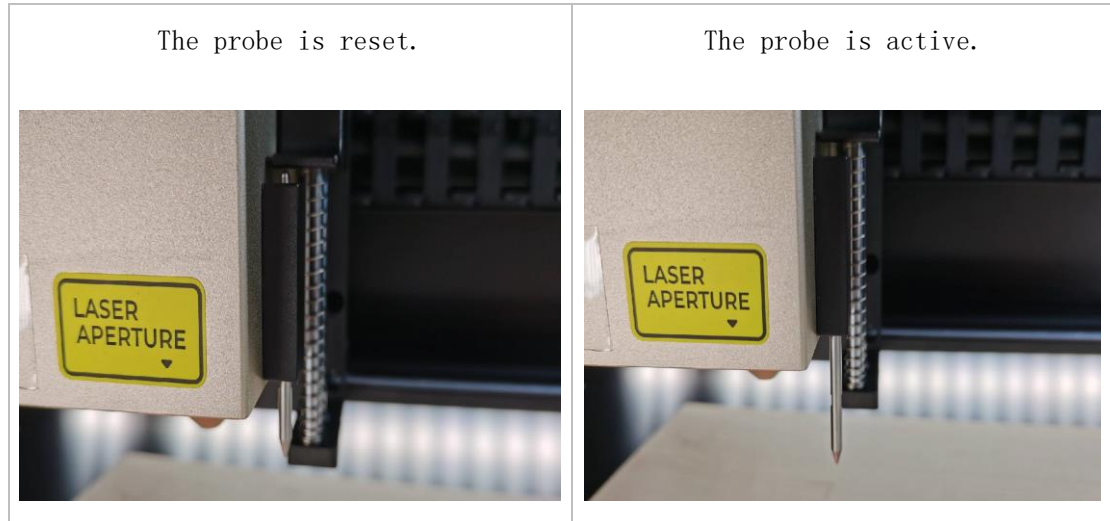
When XCS shows the error message as shown below, please follow the instructions below to troubleshoot.



## What to Do



## #1 Check if the Probe Is Reset



1. Click "Reset it" on XCS, and the laser module will move to the top right corner to reset the probe automatically.
2. Or you can push the probe upwards to reset it manually.
3. If the probe fails to be reset manually, please check if the laser module is installed properly according to [the link](#).

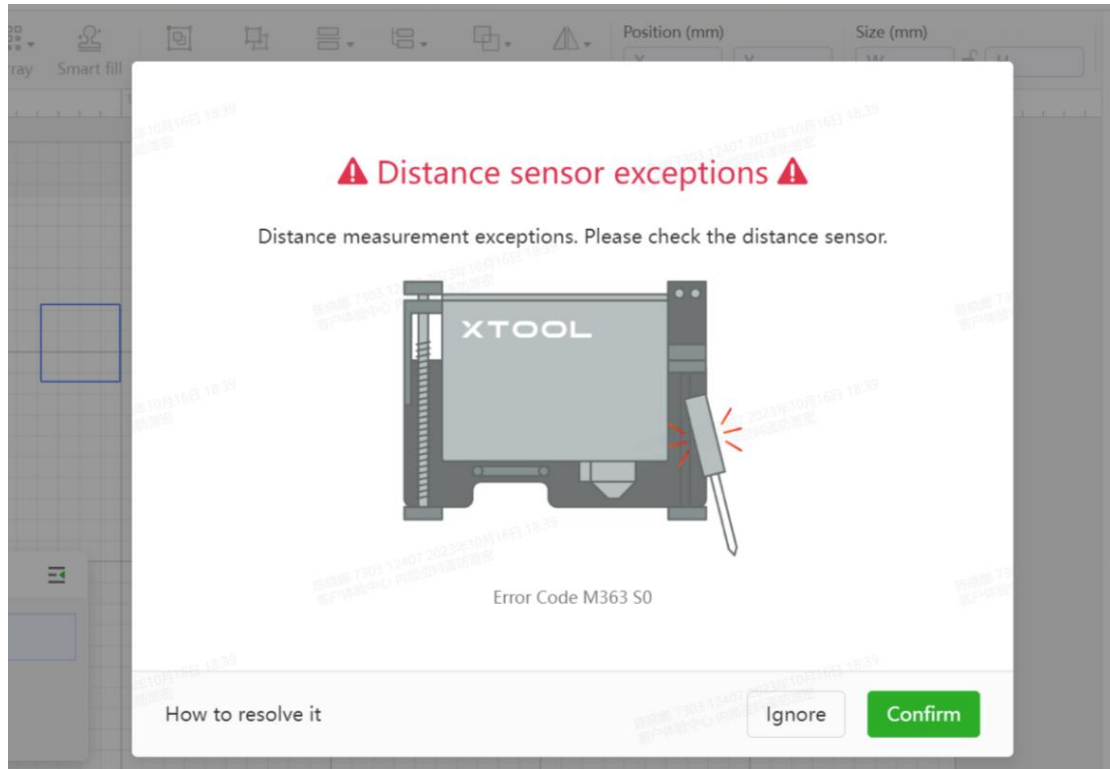
Note: It's recommended to power off the machine when you install or reset the distance sensor. Otherwise, the sensor may not be installed properly.

## #2 Check the Connection Cable

1. Check if the connection cable is properly inserted into the port on the laser module.
2. If not, insert the cable until it is fitted tightly.

Note: If the connection cable is seated loosely into the port, XCS may prompt "Communication exceptions between the laser module and the main controller". Please follow [the link](#) to troubleshoot.

## Case 2: Distance Measurement Exceptions



## What to Do

### 1. Check If the Distance Sensor Falls Off

If yes, please follow the link to install the distance sensor on the laser module.

<https://youtu.be/w-OwNI5Rq5M>

Note: If the distance sensor is not installed on the laser module, or the sensor falls off during processing, XCS will show the error message.

### 2. Check If the Distance Sensor Is Installed Properly

If it's not installed properly, related signals can't be transmitted to the machine.

Please follow the link to install the distance sensor on the laser module.

<https://youtu.be/w-OwNI5Rq5M>



Note: The distance sensor is installed on the laser module via magnetic attachment.

### 3. Check the Height of the Processing Material

Refer to the chart below about the height requirements of the processing material.

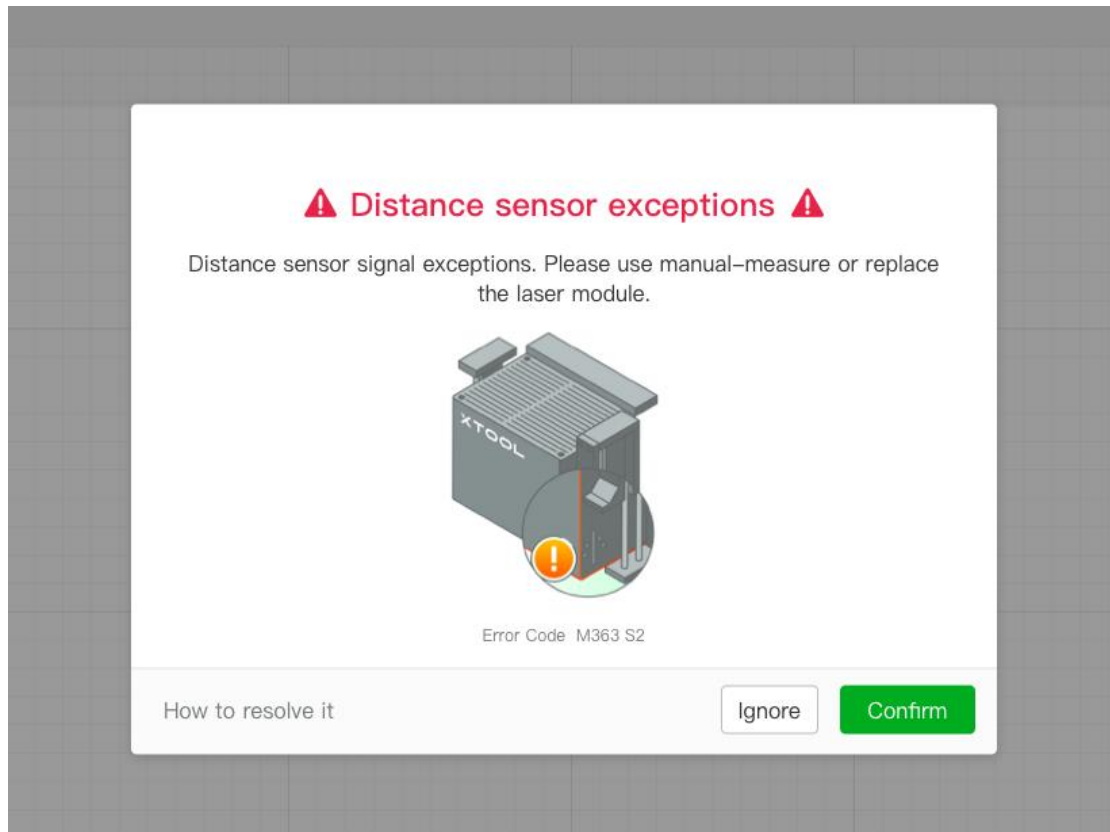
| xTOOL S1 + Accessory   | Hight Requirements                             |
|--|--|
| xTool S1   | $0 \text{ mm} < H \leq 42 \text{ mm}$          |
| xTool S1 + Blade   | $0 \text{ mm} < H \leq 34 \text{ mm}$          |
| xTool S1 + Honeycomb Panel   | $0 \text{ mm} < H \leq 15 \text{ mm}$          |
| xTool S1 + Riser Base  | $70 \text{ mm} \leq H \leq 125 \text{ mm}$     |
| xTool S1 + Riser Base + Honeycomb Panel                            | $0 \text{ mm} < H \leq 99 \text{ mm}$          |
| xTool S1 + Riser Base Supporting Conveyor Feeder                   | $15.5 \text{ mm} \leq H \leq 133.5 \text{ mm}$ |
| xTool S1 + Riser Base Supporting Conveyor Feeder + Honeycomb Panel | $0 \text{ mm} < H \leq 106.5 \text{ mm}$       |

1. Please make sure the height of the processing material meets the requirements above. Otherwise, XCS will prompt this error message.
2. For example, when you use S1 with the riser base to process the basswood plywood 3mm thick, XCS will prompt this error message when the laser module moves downward to measure the **Distance**.
3. At the same time, you can use S1 to process materials of different heights to troubleshoot the issue.



## Case 3: Distance Sensor Signal Exceptions

When XCS shows the error message as shown below, please use manual measurement or replace the laser module.



## What to Do

### Check the Distance Sensor

1. This is usually due to a faulty distance sensor on the laser module.
2. Please contact support@info.xtool.com to replace the faulty laser module.
3. When XCS prompts this error message, and you need to process materials with S1, please measure the **Distance** manually according to [the link](#).



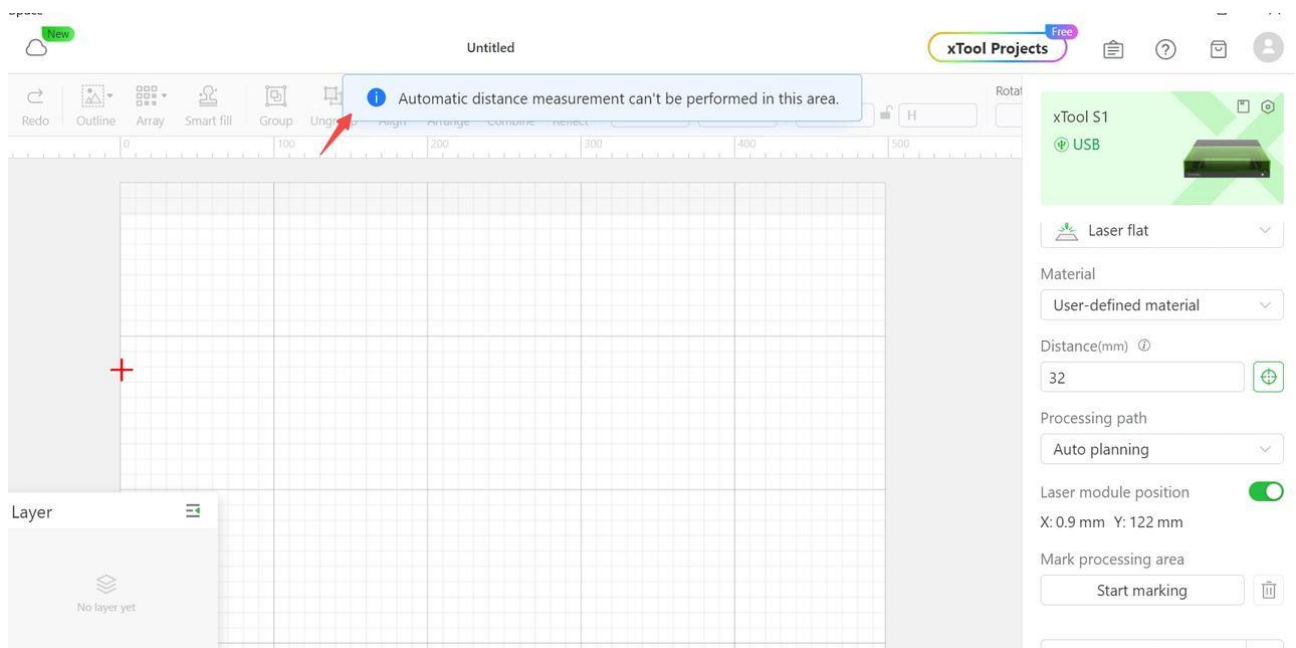
# 12. Troubleshoot “Automatic Distance Measurement Can’t Be Performed in XCS”

*This article applies to*

*S1 with all laser modules.*

## Issue Description

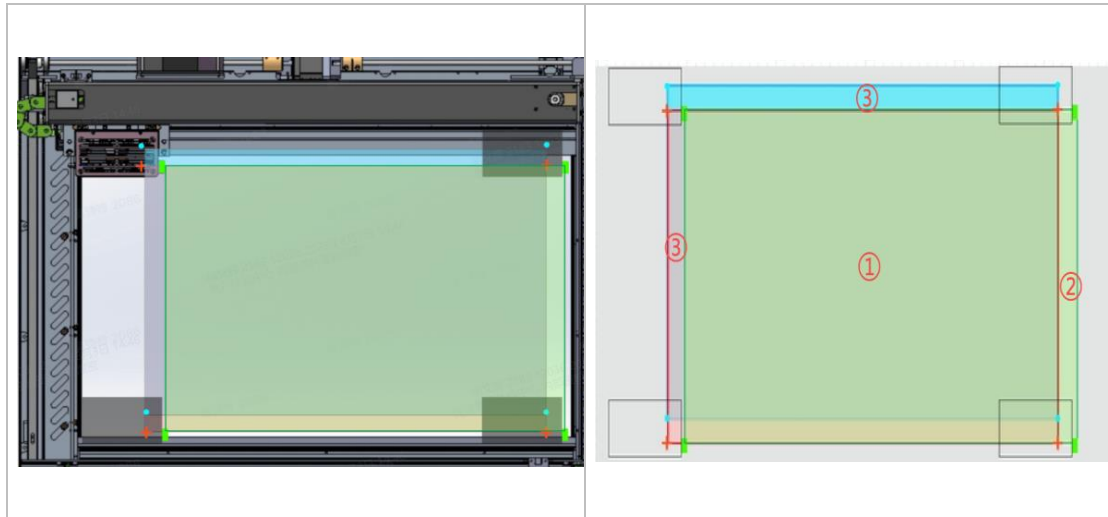
When measuring the processing area on XCS, you may see a pop-up error message like below if the laser module is positioned at the far left, far right, or next to the rear plate of the machine:



## Why it Happens



- The laser module has specific distances between the red cross-positioning light, the laser output, and the distance sensor. As the laser module moves, the areas covered by these three modules are also different.
- The ranges that the three modules can cover are marked with different colors as follows:
  - Green area: The range where the distance sensor can measure.
  - Blue area: The range where the laser can be used for processing.
  - The area enclosed by the red rectangle: The positioning range of the red crosshair.



- As shown above, the actual area available for automatic measurement is the region that all three modules can cover, which is the area marked as ①. The area marked as ② exceeds the range of the red crosshair. At position ③, the probe of the distance sensor can not reach to take measurements.
- Therefore, when the laser module is next to the rear plate, at the leftmost, or rightmost positions, and automatic measurement is initiated on XCS, a pop-up error message will appear stating, "Automatic distance measurement can't be performed in this area."



# 13. xTool S1 Cannot Connect to XCS Using a USB Cable

*This article applies to:*

*xTool S1 with all laser modules.*

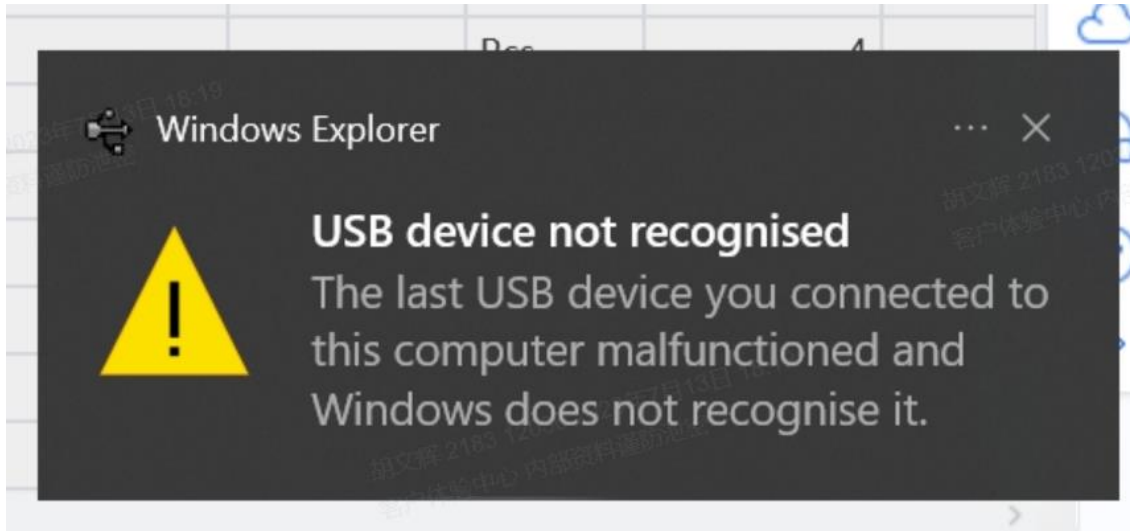
## Issue Description

When you connect the machine to the computer using the USB cable, sometimes the XCS software may not find it under the "Devices list". This will prevent you from operating the machine. Please read this guide for advice.



### #1 Check the USB cable and port

- If you are using a Windows operating system, you may also see a system pop-up like the one pictured below.
- In this case, please unplug and replug both ends of the USB cable, and push it to the very bottom so that it is fully inserted. If the problem persists, please try a different cable, USB socket, or computer for connection.

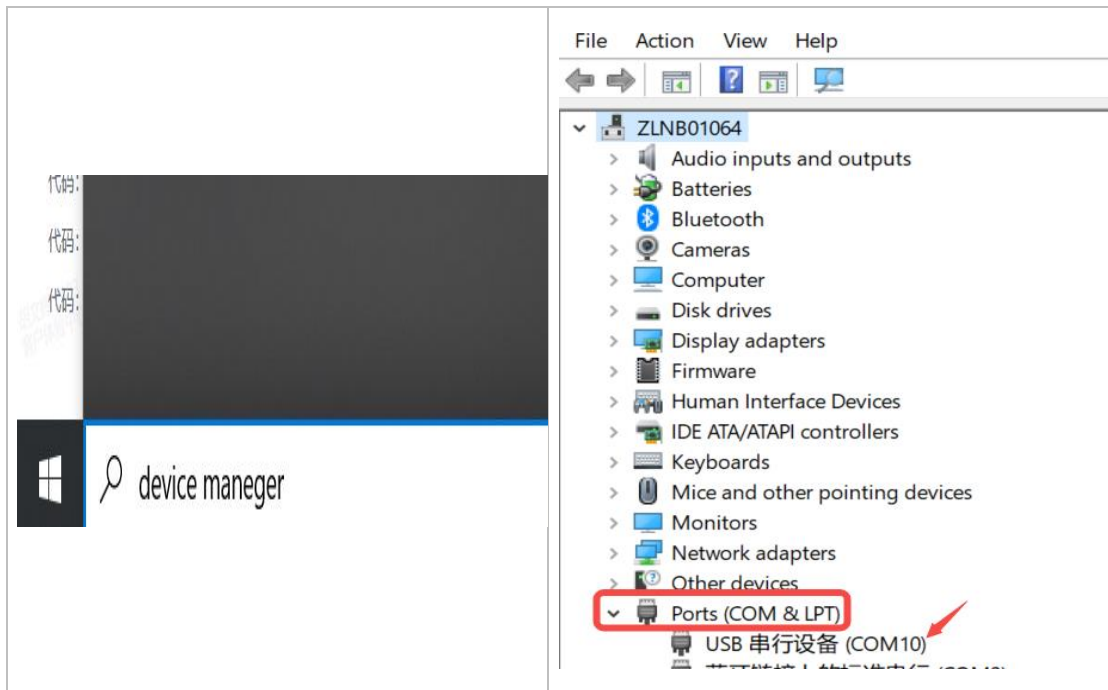


## #2 Check and install the USB driver

Check the status of the driver on your operating system as follows:

### For Windows:

1. Go to the device manager by searching it in the Windows search bar.
2. If you can find COM10 under the Ports (COM & LPT) entry, the USB connection is OK.







### #3 Disable the antivirus and firewall

If the XCS software is still unable to find the device after you have tried the above troubleshooting, please turn off your computer's antivirus and firewall functions, then restart the XCS software and try the USB connection again.

### #4 Use one operating software at a time

- Do not run multiple software that occupy the COM port at the same time. For example, if you run Lightburn or other software that uses the COM port prior to launching XCS, it may not find the device.
- Quit other software and keep XCS only. Restart the computer if necessary and try again.

### #5 Check your computer requirements

|                    | Minimum                     | Recommended                   |
|--------------------|-----------------------------|-------------------------------|
| Processor          | Intel Core i5-6200U         | Intel Core i5-11600 or higher |
| Operating System   | Win10 (64-bit)<br>Mac 10.14 | Mac 10.15 or higher           |
| Memory (RAM)       | 8GB                         | 16GB or higher                |
| Display Resolution | 1280*720                    | 1920 x 1080 or higher         |
| Hard Disk Space    | 8GB                         | 12GB or higher                |



## #6 Clear the cache for XCS software

1. Make sure the XCS is not running. Close it if it is.
2. Go to the cache folder according to the paths below. Remember to replace the User Name in the following path with your actual user name.
  - Windows: C:\Users\User Name\AppData\Roaming\xTool Creative Space\Local Storage
  - macOS: /Users/User Name/Library/Application Support/xTool Creative Space/Local Storage
1. Delete all files under the Local Storage folder.
2. Relaunch XCS and see if it works.

## #7 Try a different USB-C adapter

If you are using a computer that only has USB-C ports, you may need a USB-C to USB adapter. Some adapters may not work well. Please try a different one and see if it's OK.



# 14. xTool S1 Cannot Establish a Wi-Fi Connection with XCS

*This article applies to:*

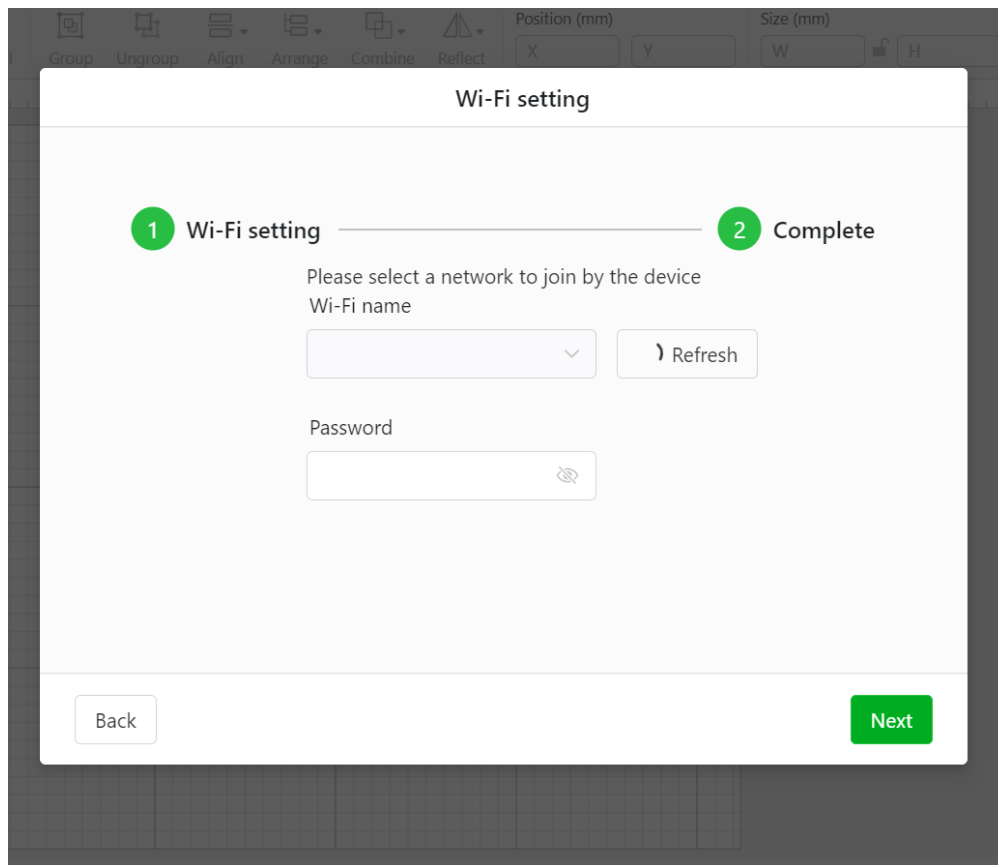
*xTool S1 with all laser modules.*

## Issue Description

When this issue happens, you may see one or more of the symptoms listed below.

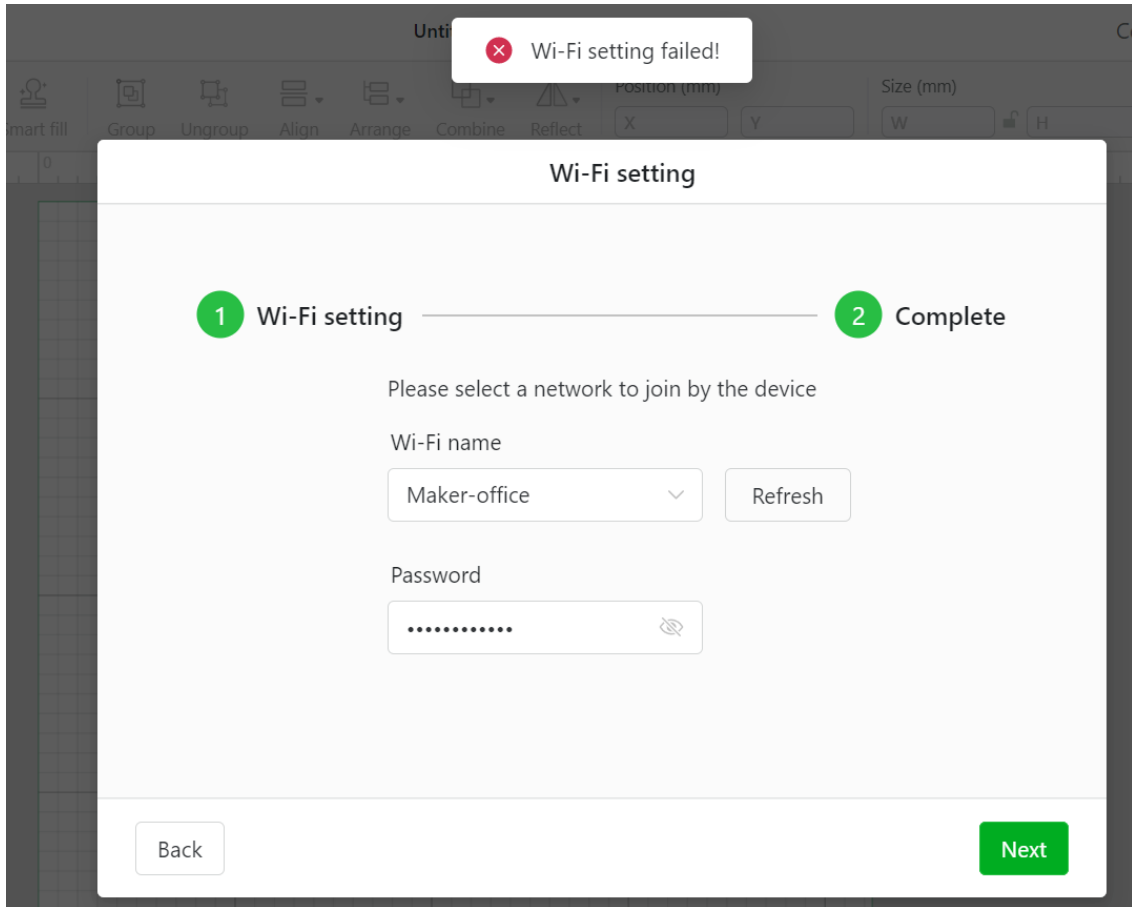
This guide will show you how to troubleshoot them with step-by-step instructions.

## XCS Can't Find the Wi-Fi Name



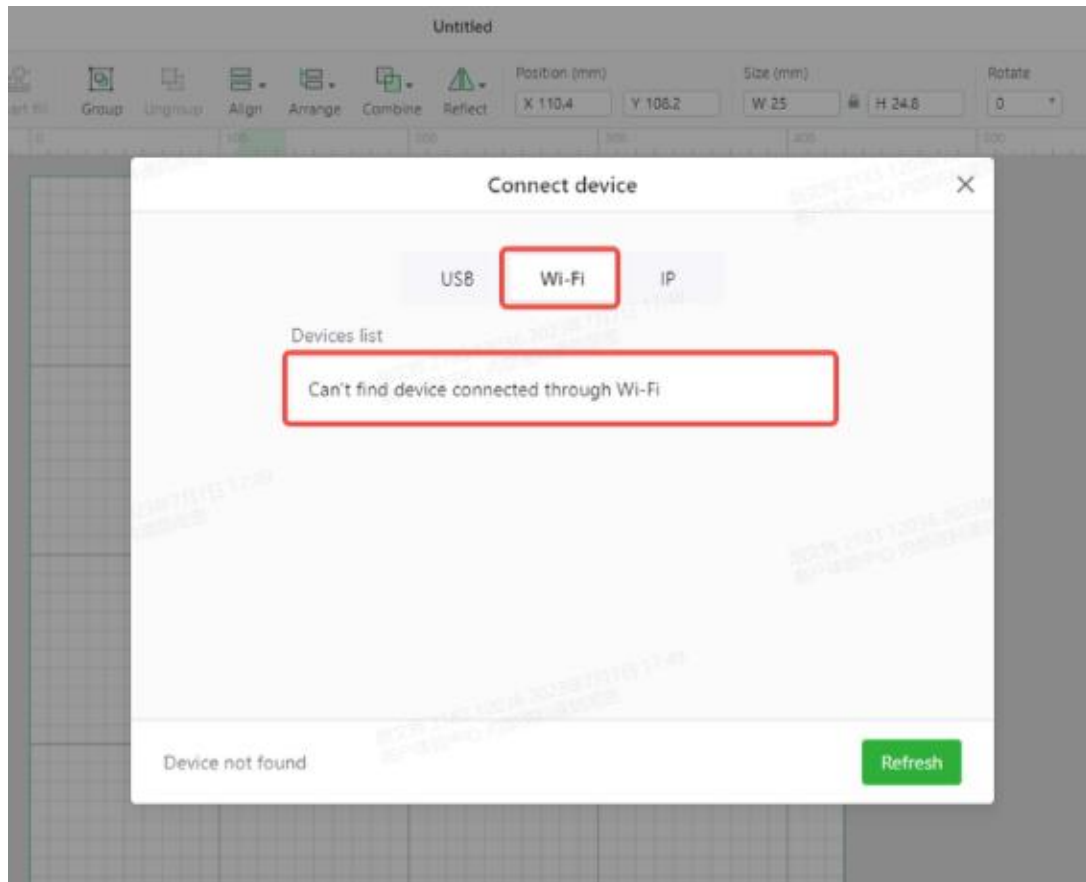


# The Wi-Fi Configuration Fails





## The Wi-Fi Name Won't Show After the Setting



Note: If you are looking for how to configure the Wi-Fi connection, please see [this guide](#).

## Solution

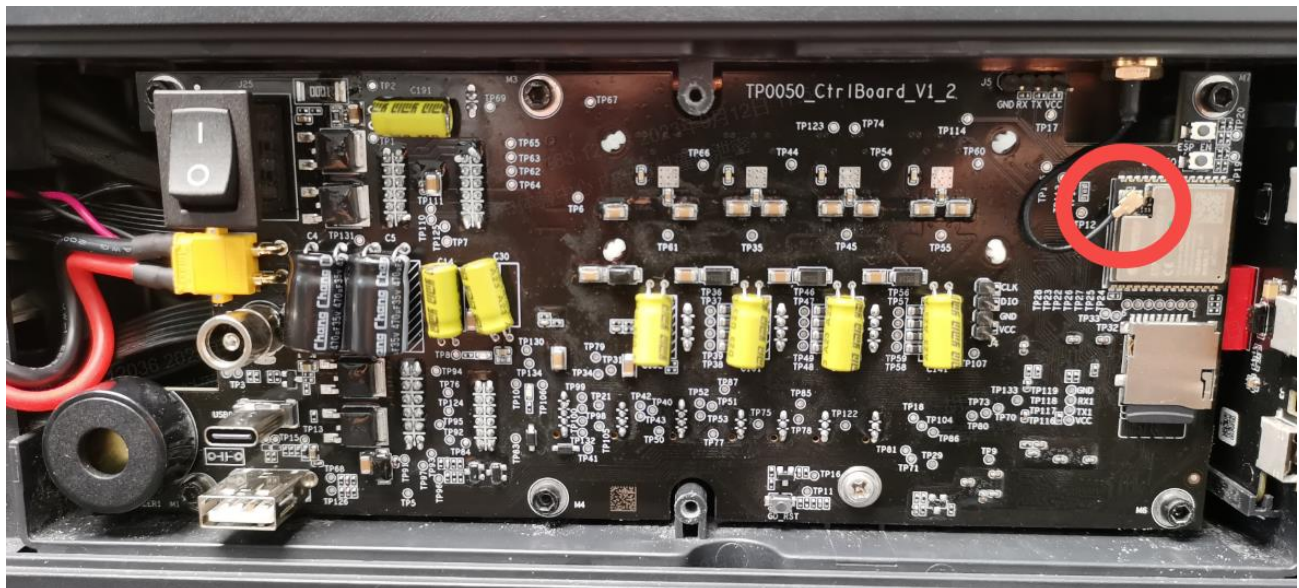
### #1 Upgrade the Firmware

Upgrade all firmware to the latest version. For details, please refer to [this guide](#).

### #2 Check the Antenna Wire of S1



1. Remove the rear interface board of the machine.
2. Check if the antenna wire on the main control board is connected properly.
3. Unplug and replug the antenna wire to make sure of a firm connection.



### #3 Check the Network Environment

- Make sure your computer and the device are under the same network.
- Make sure the Wi-Fi name and password consist of only letters and numbers.
- Make sure you enter the correct Wi-Fi name and password and try again.
- Make sure the Wi-Fi network doesn't require authentication other than the password.
- If you are using Wi-Fi with 2.4G and 5G bands combined, create a separate 2.4G network for S1.



- Try a different Wi-Fi environment, or connect your computer and machine to the same hot spot on your phone to rule out the connection failure caused by a poor Wi-Fi signal.

#### #4 Disable VPN and Firewall Software

- Some VPN or firewall software may interfere with the Wi-Fi connection of XCS.
- Disable the VPN and antivirus software, and turn off the firewall function on your computer.
- Then, restart both XCS and the machine, and try again.

#### #5 Try Using the XCS Mobile App

1. Refer to [this guide](#) to configure Wi-Fi in the XCS application.
2. If configured successfully, the IP address of the device can be found in the application.
3. Connect the computer to the Wi-Fi configured in the application. (Not the hotspot of the machine)
4. Enter the IP address of the device to establish the connection in XCS on the computer.



### Device Details



Device name xTool S1

Laser model 20 W

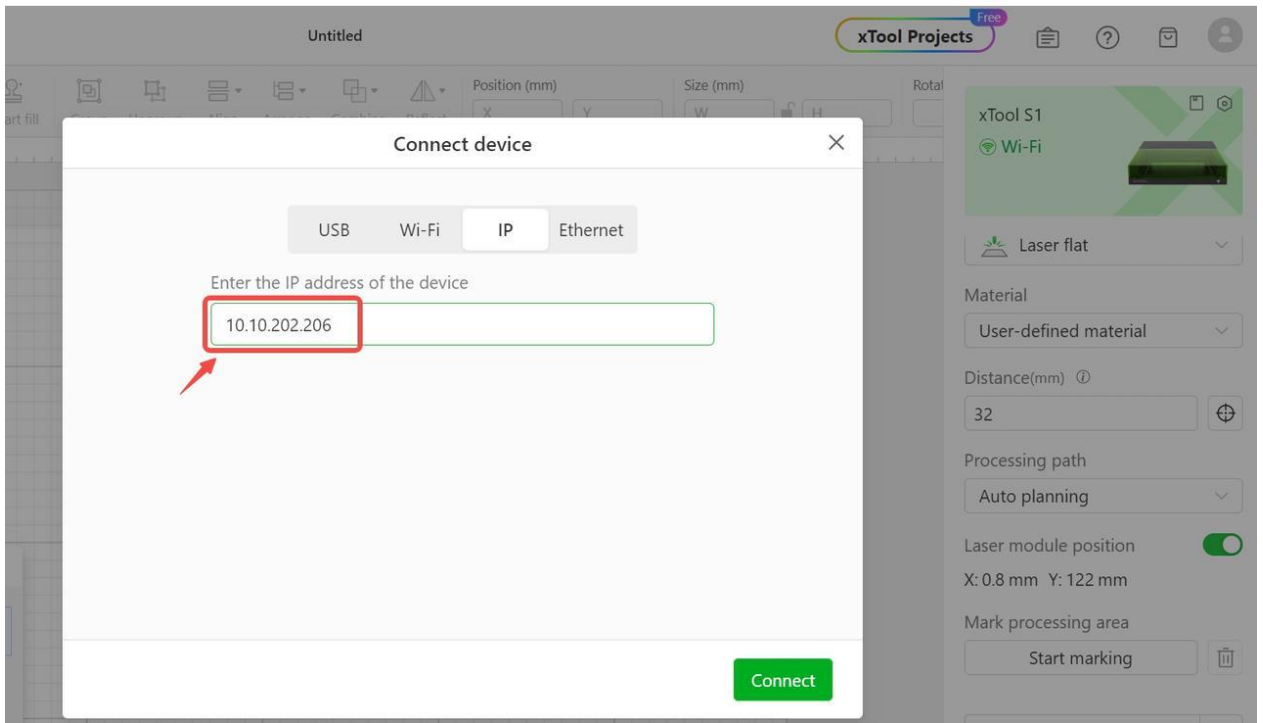
Serial number  
MXDK101001230605F6C7CC0

Firmware version  
V40.32.002.2025.01 B01  
V40.32.002.2122.01 B01  
V40.32.002.2224.01 B01

Check for updates

Wi-Fi setting  
10.10.202.206

Working parameters





# 15. Troubleshooting FAQs on Operating xTool S1 with Lightburn

## Things to Know Beforehand:

- LightBurn is a third-party software not developed by xTool. It has a different logic for file transmission, Gcode processing, etc., compared with XCS.
- Extensive tests and firmware adjustments were made for xTool products to be compatible with Lightburn. However, in some cases, there could still be problems using LightBurn with xTool machines.

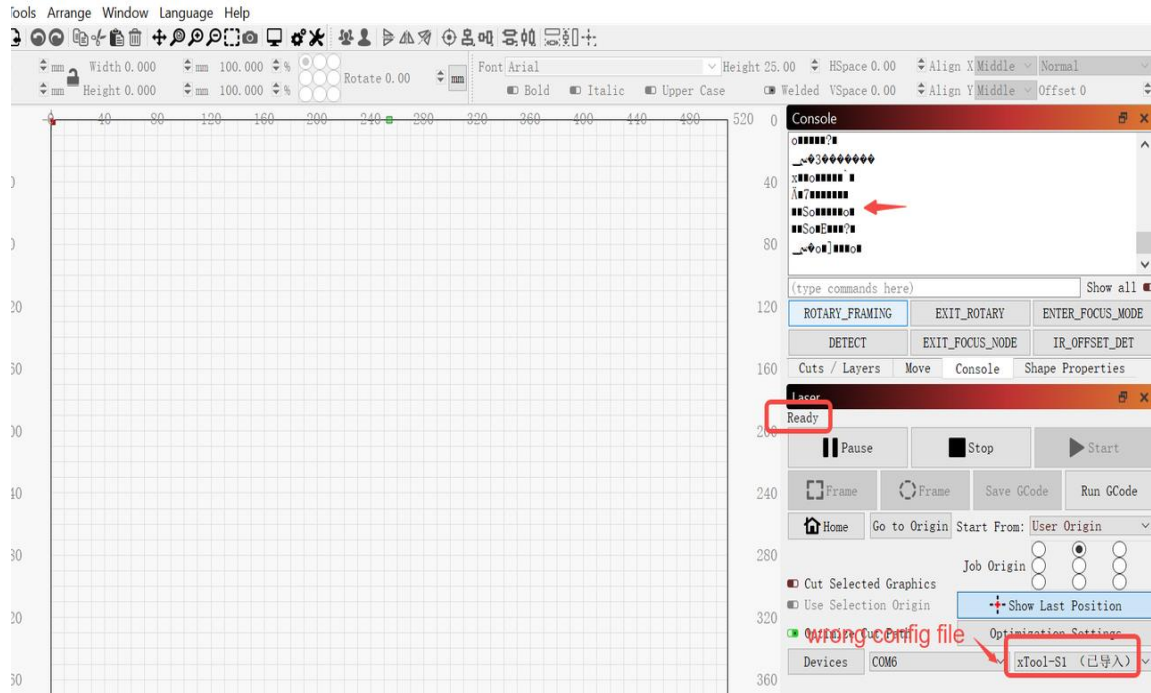
**Note:** If there is an issue with Lightburn usage or processing, exit and try using XCS for the same task.

Do not have Lightburn and XCS run at the same time, especially when a job is in progress.

## FAQs

### 1. What to do if there is garbled text on Lightburn?

- If you see garbled text on the Console of Lightburn, it's usually caused by a wrong device config file.
- Please make sure the imported config file is correct for the machine you are using (as shown below).



## 2. Why does the laser module jitter or the engraving depth look inconsistent for bitmap pictures?

- Due to the difference between the Gcode file generated by Lightburn and that generated by XCS, it's recommended to use XCS to avoid jitters or unstable laser module movements.
- The deepening of the engraving occurs when the Constant Power Mode is enabled in LightBurn. When the laser module decreases in speed during processing and the power doesn't change, it leaves darker marks. If you need to use Lightburn to process bitmaps, turn Constant Power Mode off in the Lightburn software.



### Cut Settings Editor

00

Name C00  Output

1 Line  +  -

Sub-Layer Name   Output Sub-Layer

Speed (mm/sec) 80.00

Max Power (%) 60.00   Air Assist

Constant Power Mode

Mode Line

**Common** Advanced

Number of Passes 1

Z Offset (mm) 0.00  (none)

Z step per pass (mm) 0.00  (none)

Kerf offset (mm) 0.000  (off)

Perforation Mode  0.10  Cut

0.10  Skip

Tabs / Bridges

Tab Generation  Automatic  Manual

Tab Size (mm) 0.50

Even Spacing  50.00  Spacing

Tabs Per Shape  1  Min Tabs

Limit Max Tabs 1  Max Tabs

Tab Cut Power 0  % of max power

Clear Tabs  Skip Inner Shapes

Reset to Default Make Default Make Default for All Cancel **OK**



3. When you pause or resume a job in Lightburn, the annular indicator on the machine doesn't show the status accordingly.

- For example, the annular indicator may still show the job is in progress even if Lightburn shows it's paused and the laser module has stopped processing.
- The issue is due to the commands from LightBurn not being transferred to the machine in a timely manner. If this issue occurs, please try using XCS instead.



# 16. xTool S1 Won't Power On or Seems to Be Non-Responsive

*This article applies to:*

*S1 with all laser modules.*

## Issue Description

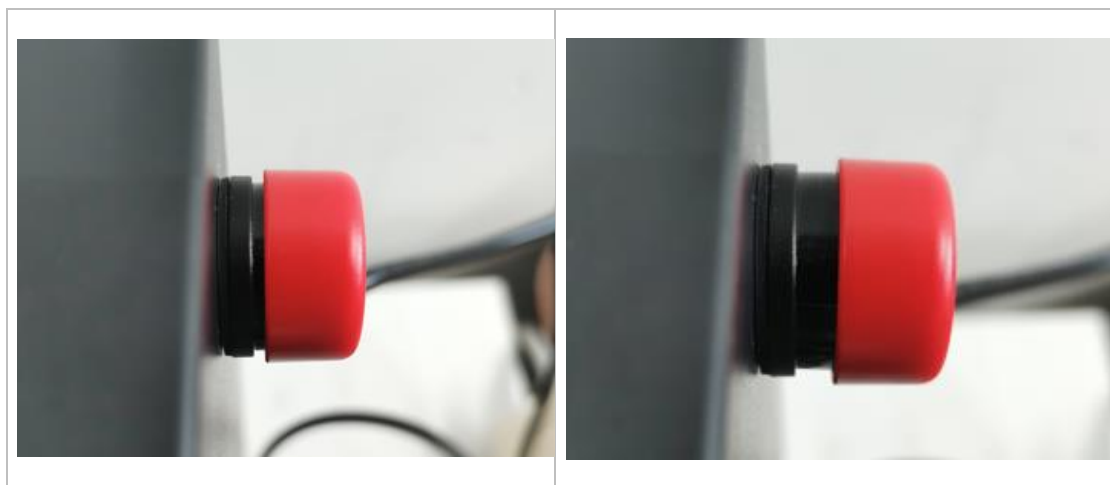
If S1 won't power on, please follow the instructions below to troubleshoot.

## Solution

### #1 Reset the emergency stop switch

When the emergency stop switch is pressed, the machine will be disconnected from the power supply.

If it is pressed, please turn it clockwise to reset it.





|                                       |                                     |
|---------------------------------------|-------------------------------------|
| The emergency stop switch is pressed. | The emergency stop switch is reset. |
|---------------------------------------|-------------------------------------|

## #2 Check the TF Card

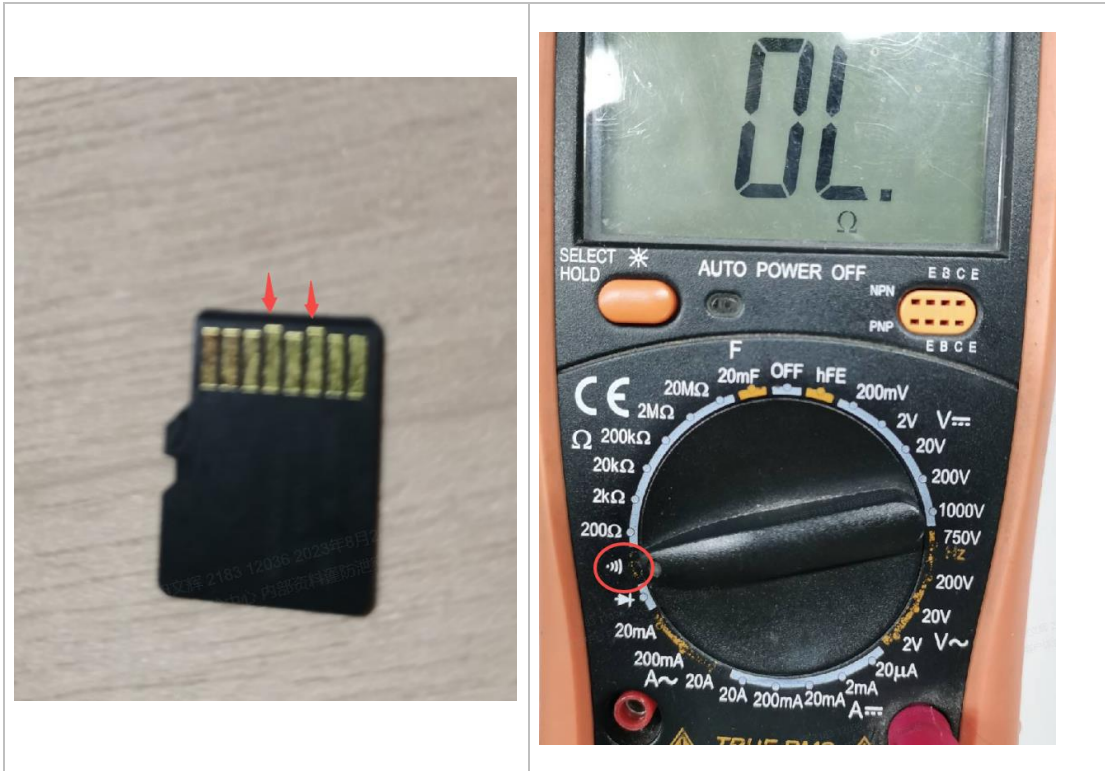
When the TF card is faulty, the indicator on the main control board will be on. But the LED strip on the front and rear plate, and the red cross light of the laser module will be off. This may appear as if the machine is not powered on.

Try the following to determine if the TF card has to do with it:

1. Take off the TF card and see if the machine is back to normal.
2. Put it back into the machine and see if the machine gets non-responsive again.
3. If so, the TF card is causing the issue and may need to be replaced.

Additionally, if you'd like to dig into the TF card, here are something you can try:

1. Check the appearance of the TF card.
  - See if the card is in good shape.
  - See if the pins are deformed.
1. Get a multimeter and switch it to buzz mode.
2. Get the probes and test the two pins shown in the photo.
3. If the buzz goes off, the TF card is likely to be short-circuit.



Note:

- The TF card needs to be in FAT32 format and less than 32G.
- Third-party TF cards are not tested and may not be compatible with the machine.
- It's recommended to contact support@xtool.com for the replacement of the TF card.
- You can replace the TF card according to the video tutorial:

<https://youtu.be/HajK7kMVEGs>

### #3 Check the Power Adapter

1. Check if the indicator on the power adaptor is bright and solid. If not, the adaptor can be faulty.
2. Get a multimeter. Check if the adaptor's output voltage is about 25V. If not, it needs to be replaced.

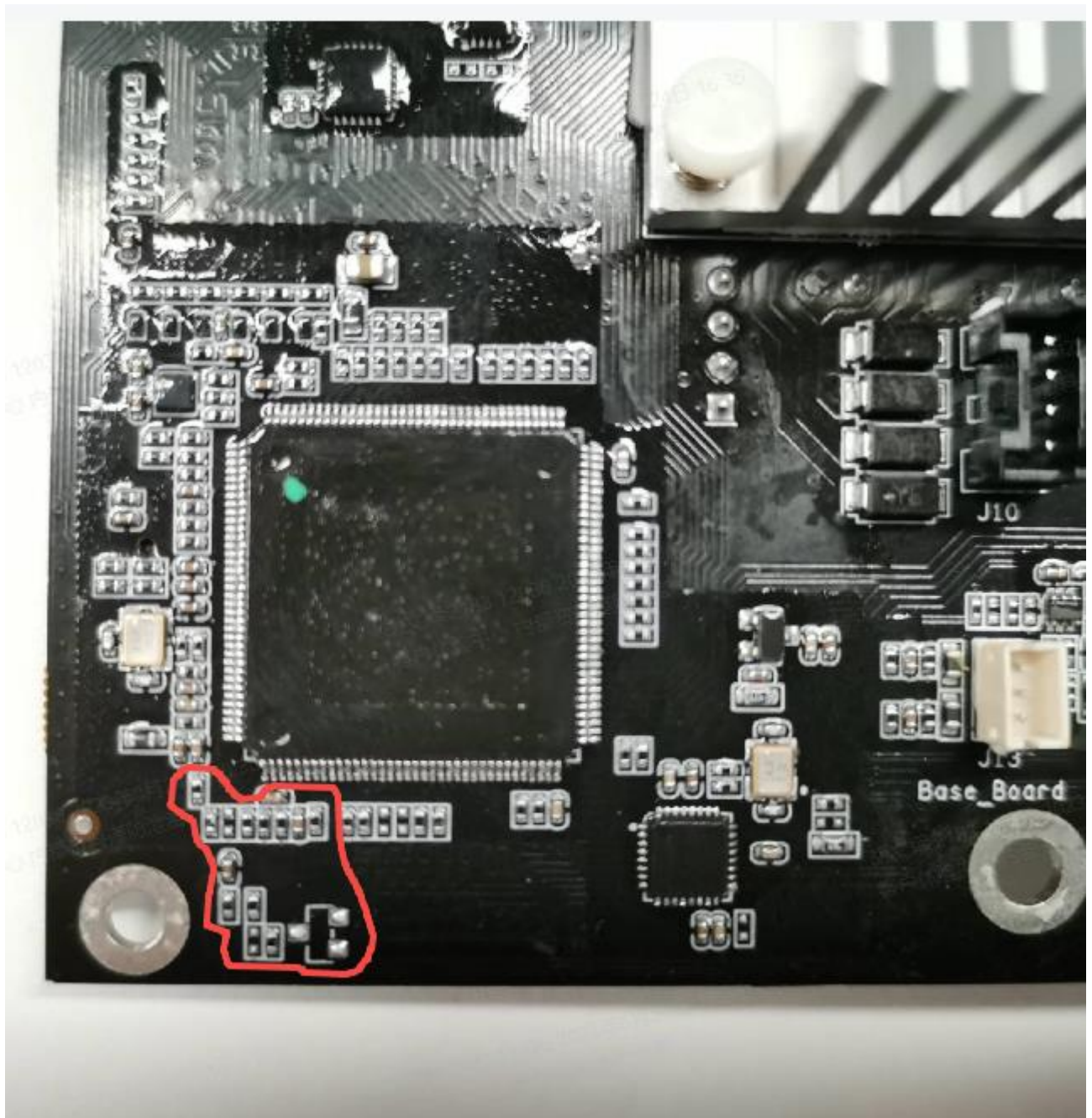




## #4 Check the Main Control Board

### The Control Board Resistor

- In some cases, the resistor on the control board may fall off during transportation.
- Please check if the black resistor circled in the photo is missing.
- If yes, the main control board needs to be replaced.

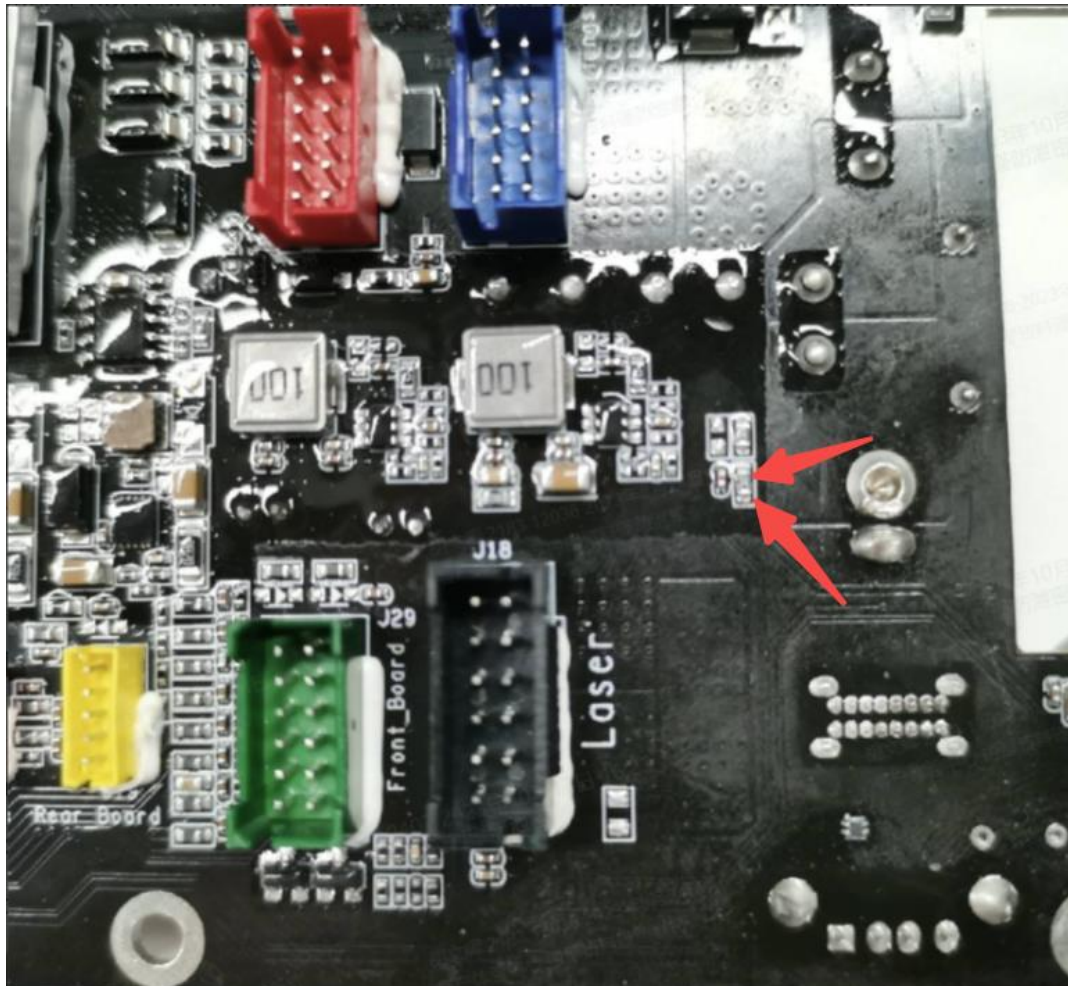




## The Voltage Readings (1)

1. Connect the power adapter to the main control board.
2. Turn on the main control board.
3. Switch the multimeter to AC voltage mode.
4. Put the probes on the pins pointed out in the photo below.
5. Check if the voltage reading is around 3.2V~3.3V.
6. If not, the main control board is faulty and needs to be replaced.

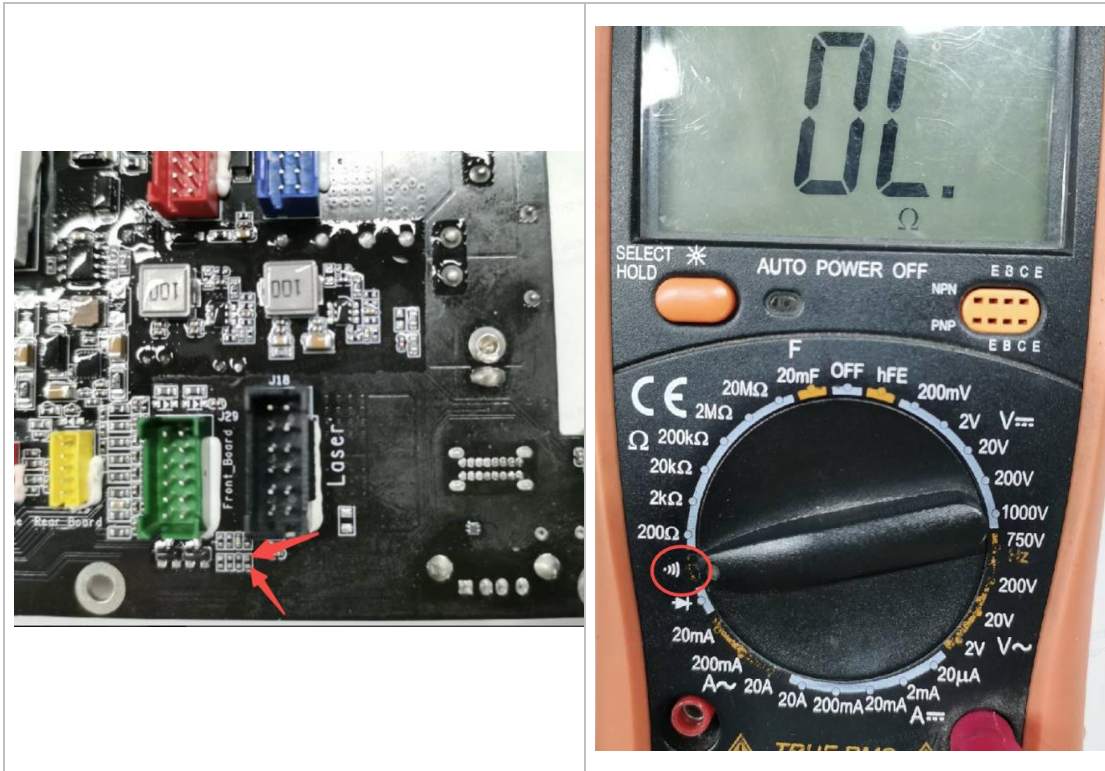
Note: The control board has a layer of conformal coating, which may affect the readings of the multimeter. Please make sure the probes are in contact with the pins properly for accurate results.





## The Voltage Readings (2)

1. Switch the multimeter to buzz mode.
2. Put the probes on the pins pointed out in the photo below.
3. If the multimeter buzzes, the main control board has a short circuit and needs to be replaced.





# 17. xTool S1 Keeps Processing the Same File

*This article applies to:*

*xTool S1 with all laser modules.*

## Issue Description

Sometimes the machine keeps processing the previous file when a new file is sent for engraving or cutting.

## #1 Check the Status of the Machine

The TF card of S1 is used to hold the file sent from XCS for processing. If you start the job before the file is sent, the machine will process the existing file. You can determine the machine's status by observing the color of the annular indicator:

### The indicator is solid white or purple

This means that the machine is on standby or is connected to XCS with Wi-Fi. The new file may not be ready at this time. If you press the button, the machine will start processing the file previously saved on the TF card, not the image previewed on XCS.

### The indicator is solid blue

This means that the machine is ready and will process the image previewed on XCS. However, if the processing result differs from what was previewed in the software, follow the steps below to check for an issue with the TF card.



## #2 Check the TF Card

Power off the machine, unplug, and re-plug the TF card. See the video guide below for details.

<https://youtu.be/HajK7kMVEGs>

Restart the machine to check if the issue persists. If the issue persists. Contact xTool Customer Service and provide your software and firmware version, Gcode file, video recording of the issue during processing, and the XCS file used for processing for further assistance.



# 18. xTool S1 Won't Stop Working When the Lid Is Lifted

*This article applies to:*

*xTool S1 with all laser modules.*

## Issue Description

Under normal circumstances, opening the lid of xTool S1 should stop the ongoing job, while a pop-up error message pops up in the XCS software. However, if you find the machine keeps working with the lid opened, please see this guide for advice.

## Possible Cause

The lid detection could be disabled by incorrect command. Make sure that you have not sent any commands to the machine using any serial port tools or Lightburn. Incorrect command can block the machine's lid detection function.

## Solution

We can use the Lightburn software to check if this function is disabled, and then turn it back on.

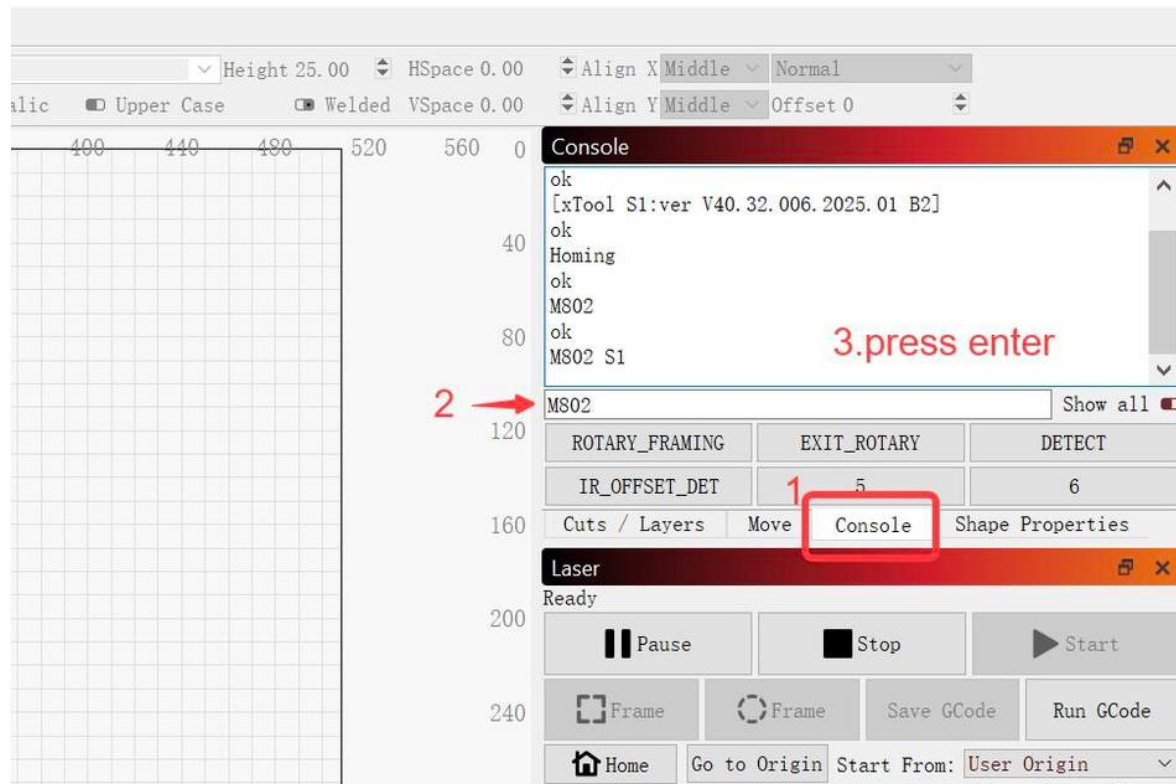
### #1 Connect Lightburn

About using Lightburn with xTool S1, please see [this guide](#) for details.

### #2 Check the Detection Status

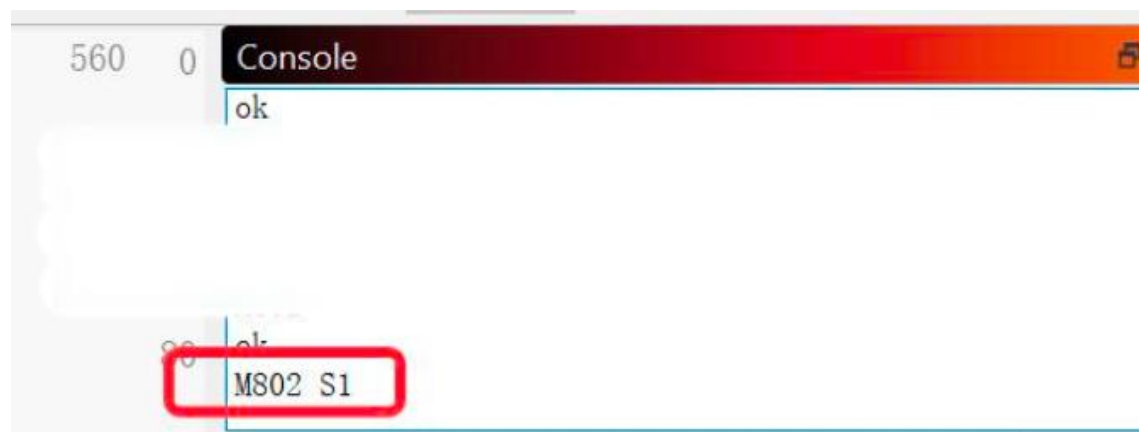


Enter the command "M802" in Console and press Enter to send it.



See the message the Console returns:

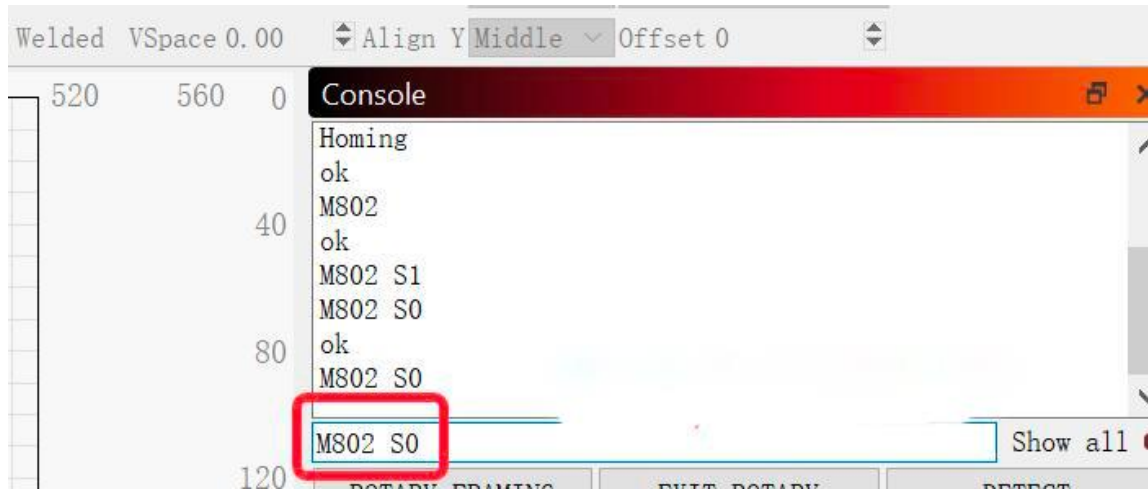
- If it's "M802 S0", the detection is enabled.
- If it's "M802 S1", the detection is disabled.



### #3 Enable the Lid Detection



Enter the command "M802 S0" to enable the lid detection.





# 19. Troubleshoot "Sending file failed" for xTool S1

This article applies to:

xTool S1 with all laser modules

## Issue Description

The Gcode file fails to be sent to the machine before the processing can begin. You'll see a pop-up error message that says: "Sending file failed. Please try again later."

## Solution

### #1 Reduce the File Size

The wireless transmission can slow down if the Gcode file is larger than 500MB. It takes longer and is more subject to the network quality. Try with a smaller file for better chances of a successful sending.

### #2 Use the USB Connection

As mentioned above, the wireless connection can be subject to network fluctuation. Try using the USB cable for connection so that the sending doesn't get discontinued.

### #3 Check if the Card is Faulty

1. Take off the TF card. See [this video](#) for details.
2. See if the card is physically damaged such as bent.
3. Test if the card has a short circuit:



1. Get a multimeter and set it to the buzzer mode.
2. Place the probes on the two longer pins.
3. If you hear the beep, the card has a short circuit.
4. Replace the TF card with a new one and check again.



## #4 Check if the Card is Compatible

Connect the TF card to a computer with a TF card reader.

- For the TF card that comes with your xTool machine, make sure it's FAT32 formatted.
- For a third-party TF card, make sure it's smaller than 32GB and the same format.

Note: third-party TF cards are not tested by xTool and may not work well with the products.