Scotle HANS Laser OUYA 3D MOPA Fiber Laser Marking Machine Manual

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Content

1. Safety Information

Laser marking machine is a Class 4 laser product with dangerous, the NOHD distance is 20M, invisible laser radiation. This product emits infrared laser radiation with a wavelength of 1064nm, which can cause damage to eyes and skin directly or indirectly exposed to such light intensity. This infrared radiation is invisible, and the laser beam can cause irreversible damage to the retina or cornea. Before operating the laser marking machine, be sure to wear appropriate and certified 1064nm near-infrared band laser protective glasses. the glasses should conform to OD6+ standard;

Important:

◎ Never look directly at the fiber output connector, and make sure to wear appropriate protective goggles when using the laser to avoid injury.

◎ Do not open the laser, because there are no product parts or accessories for users to use inside the laser.

◎ When using this product, please use a properly grounded power supply and normal voltage.

◎ Before starting the laser product, please ensure that the ambient temperature and humidity are within the specified range.

◎ Do not expose the product to an overly humid environment.

◎ The laser is cooled by air. Please ensure that the ambient air is dry and clean.

◎ Operations or adjustments beyond the scope specified in this manual may cause dangerous radiation damage.

◎ Keep the output galvanometer clean. After each use, please cover the protective cover. Do not touch the field lens with your hands, and do not use any solvent to clean the field lens. When necessary to clean and maintain the lens, be sure to use lens paper.

Warning:

◎ Operations or adjustments beyond the scope specified in this manual may cause radiation damage.

As shown in the table below, all safety warning signs (not limited to those affixed to the body of the laser) during the operation of the laser marking machine are included:

Safety signs	Description
	AVOID EYE OR SKIN EXPOSURE TODIRECT OR SCATTERED RADIATION VISIBLE AND INVISIBLE LASER RADIATION
	LASER LAUNCH FROM HERE TEXT WITH THE LASER RADIATION WARNING SYMBOL INDICATES A POTENTIAL PERSONAL HAZARD.

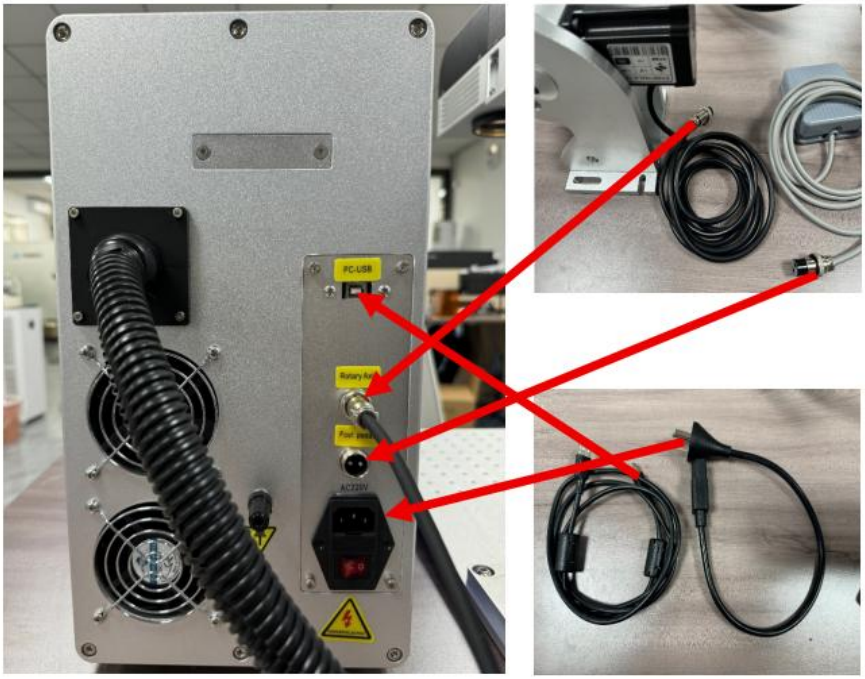
	EMERGENCY STOP SWITCH FOR LASWER SOURCE
	DANGER! ELECTRIC WORDS MARKED WITH AN ELECTRICAL WARNING SYMBOL INDICATE A POTENTIAL PHYSICAL HAZARD.
	TEXT WITH THE LASER RADIATION WARNING SYMBOL INDICATES A POTENTIAL PERSONAL HAZARD.
	THE SYMBOL INDICATES THAT PERSONNEL MUST WEAR LASER SAFETY GLASSES (PERSONAL PROTECTIVE EQUIPMENT) TO PREVENT LASER RADIATION HAZARDS.
	ALTERNATIVE LABEL FOR LASER APERTURE
	EXPLANATORY LABEL

2. Reference standards

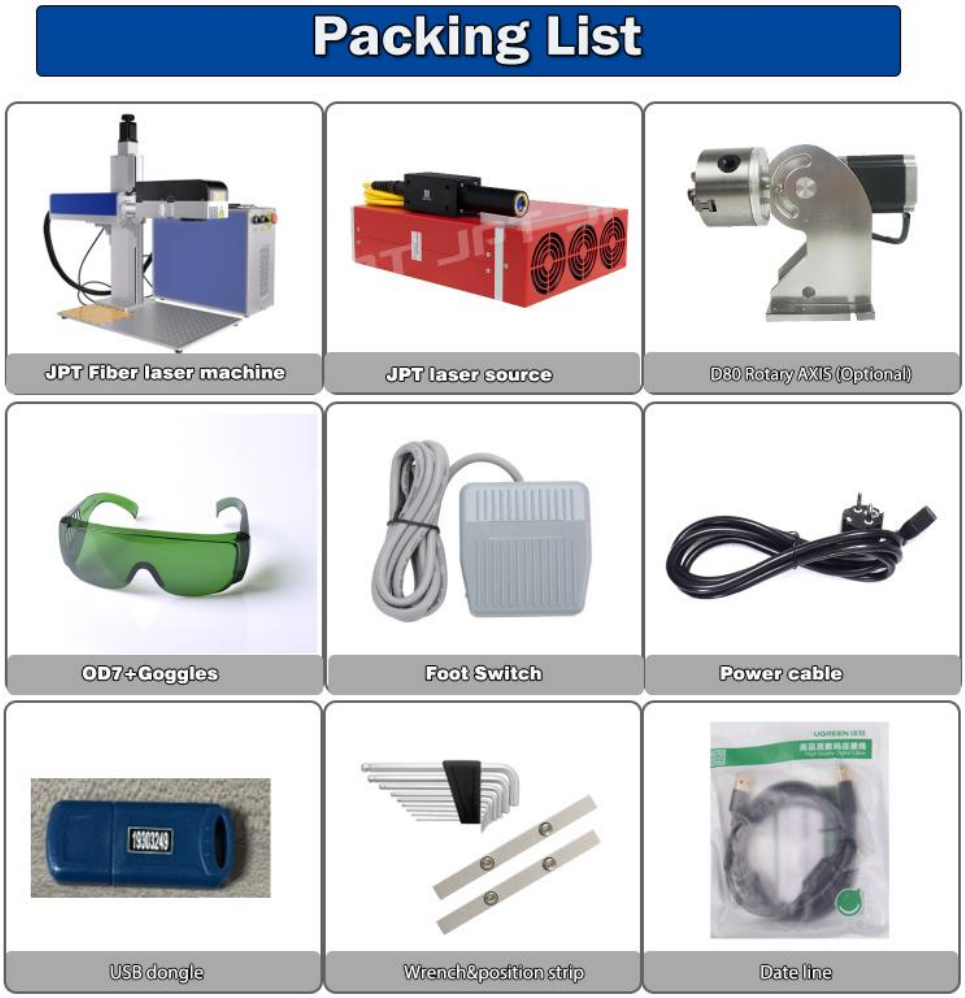
IEC 60825-1:2014
EN ISO 12100:2010; EN 60204-1:2018
EN ISO 11553-1:2020+A11:2020
EN ISO 12100:2010;
EN 60204-1:2018
EN ISO 11553-1:2020+A11:2020
FDA number: 2320736-000
2.Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
3.The laser safety classification of this product is based on EN 60825-1: 2014+A11: 2021.
4. The level of laser radiation emitted through the laser aperture exceeds Class 1.

Please note:
◎ According to EU and national standards and requirements, lasers must be classified according to their output power and laser wavelength. All high-power MFSC series laser products belong to Class 4 products (according to EN 60825-1, Chapter 8)

3. Machine introduction and connections



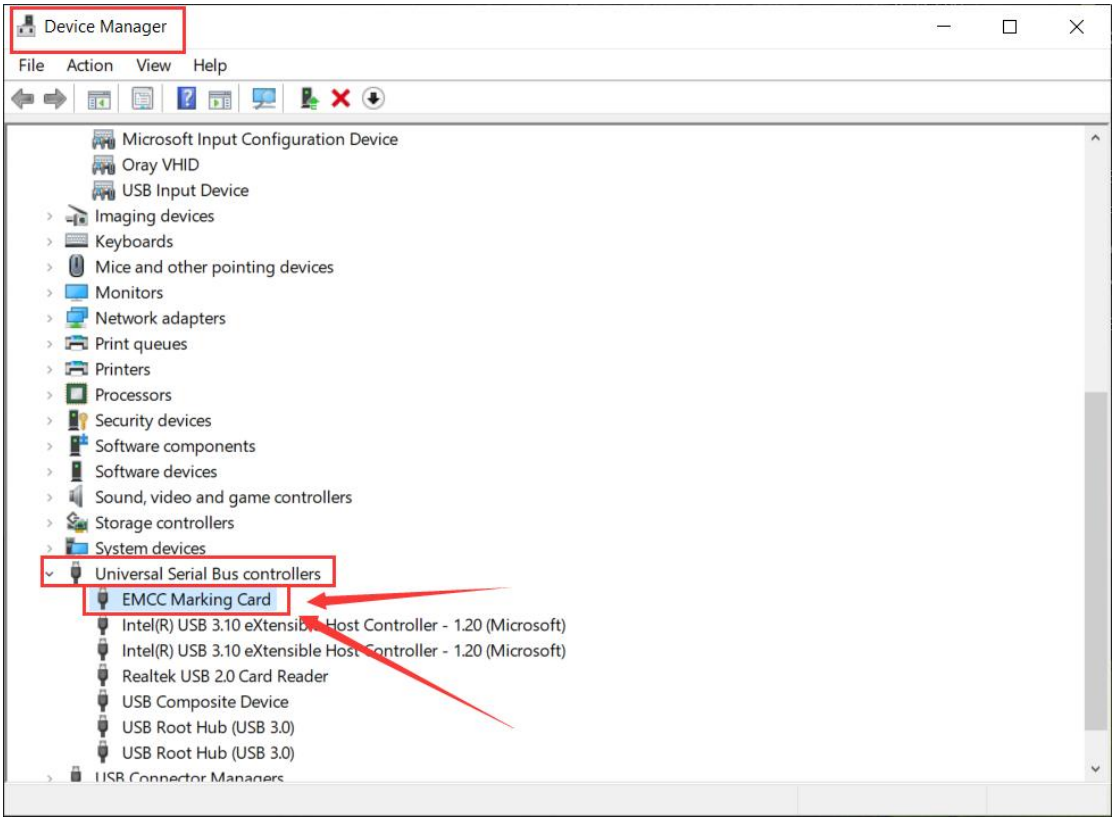
Connect the dongle (USB flash drive) separately to the computer's USB port for use when opening software later. Note: If this message still appears after inserting the dongle, simply unplug and replug it to resolve the issue. 

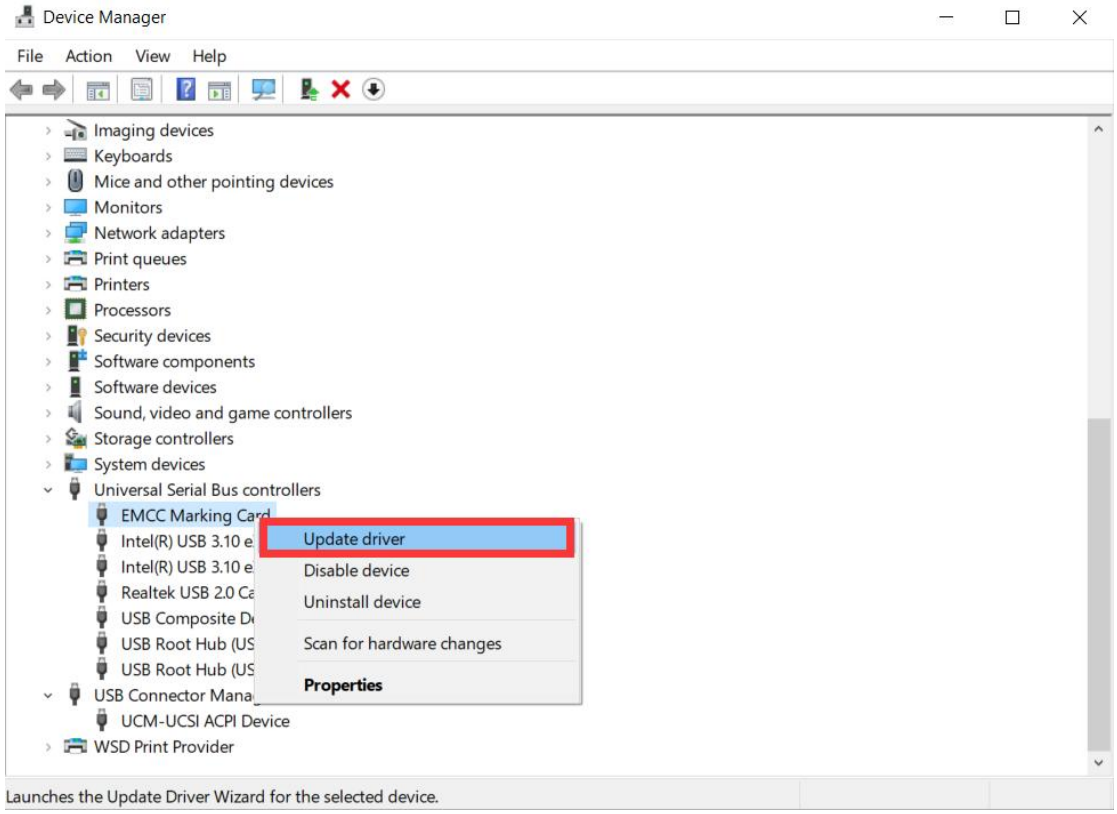


4. Power on

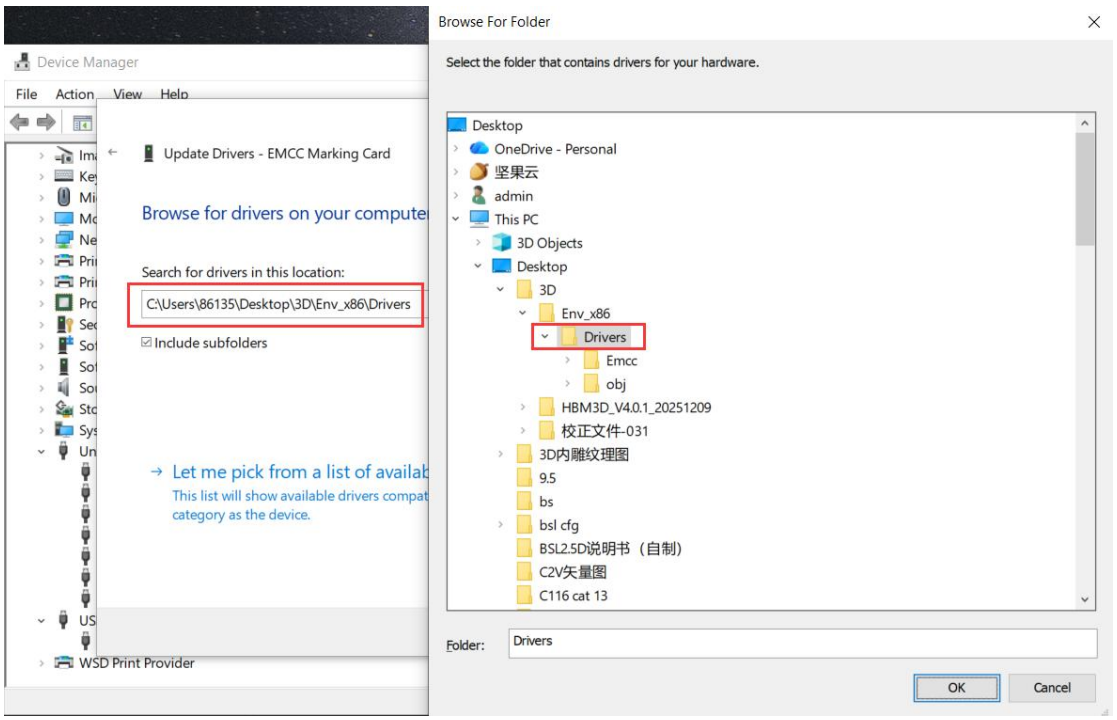
Turn on the following three switches: Emergency switch-->Power switch-->Laser switch
(When the machine is in working, keep the emergency switch in the open position)

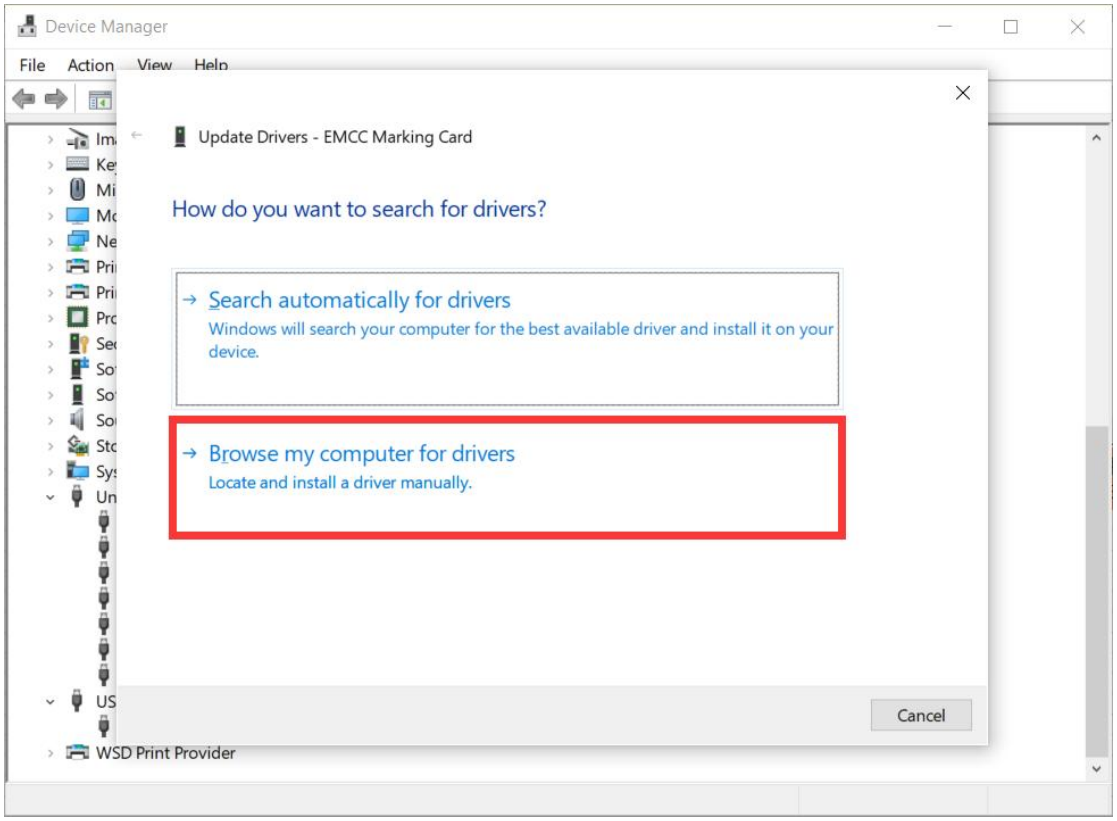
5. Software installation and USB driver installation

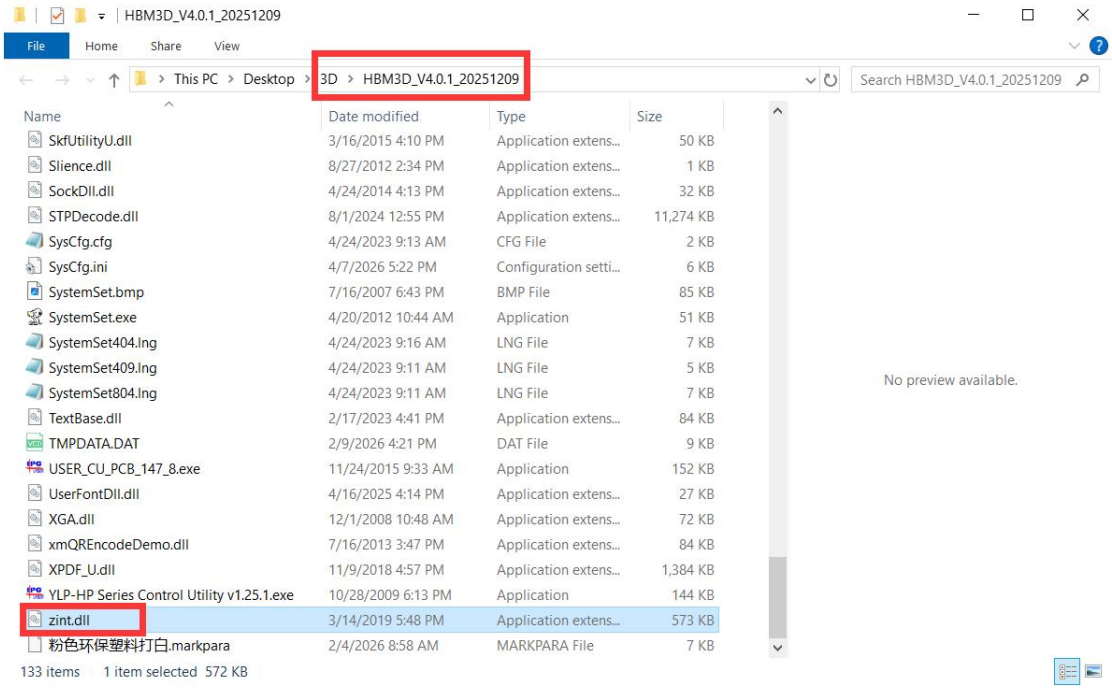




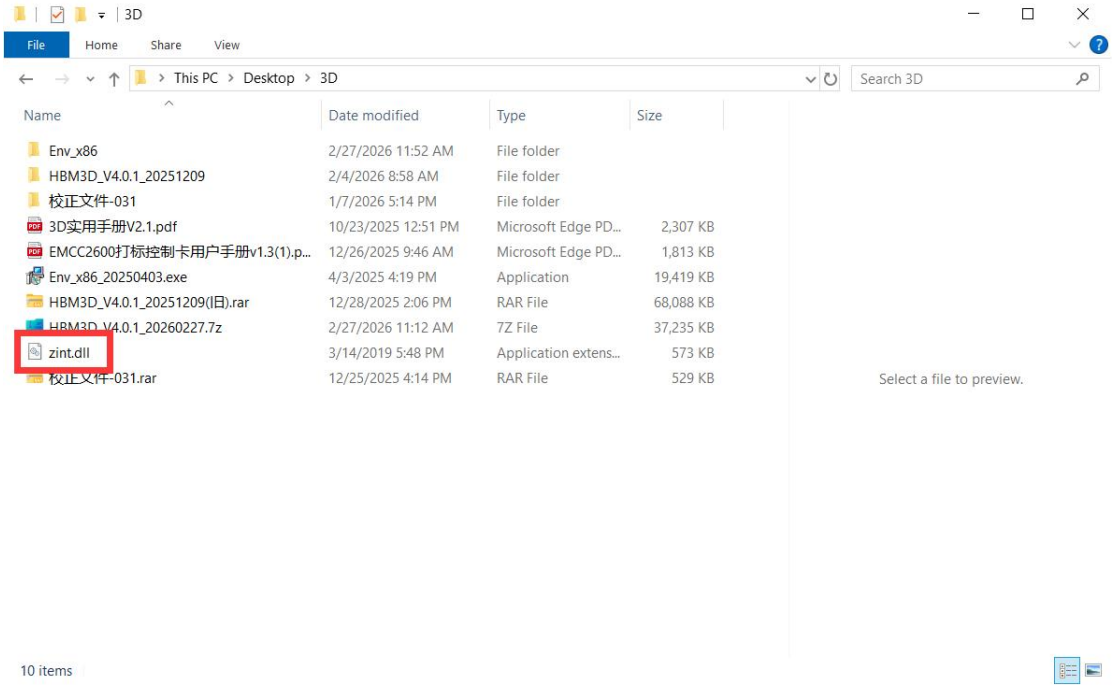
Right-click on the EMCC Marking Card



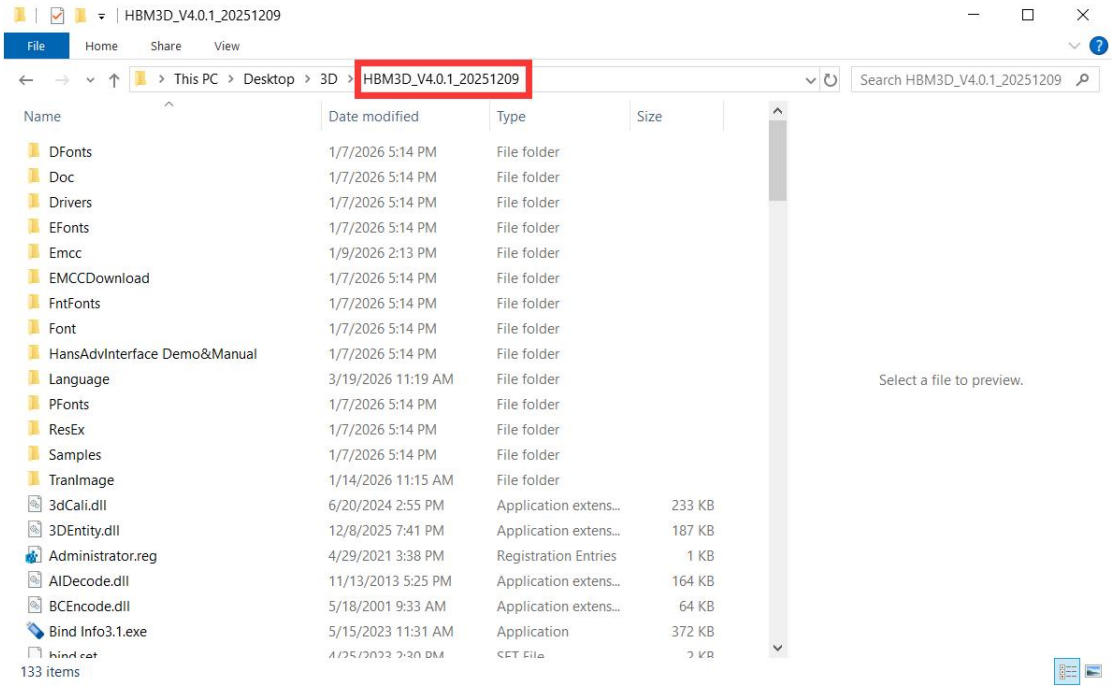




Before opening the software, please check at the bottom of the HBM3D folder for the zint.dll extension file. If it exists, ignore this step; otherwise, please follow the steps below to add it.

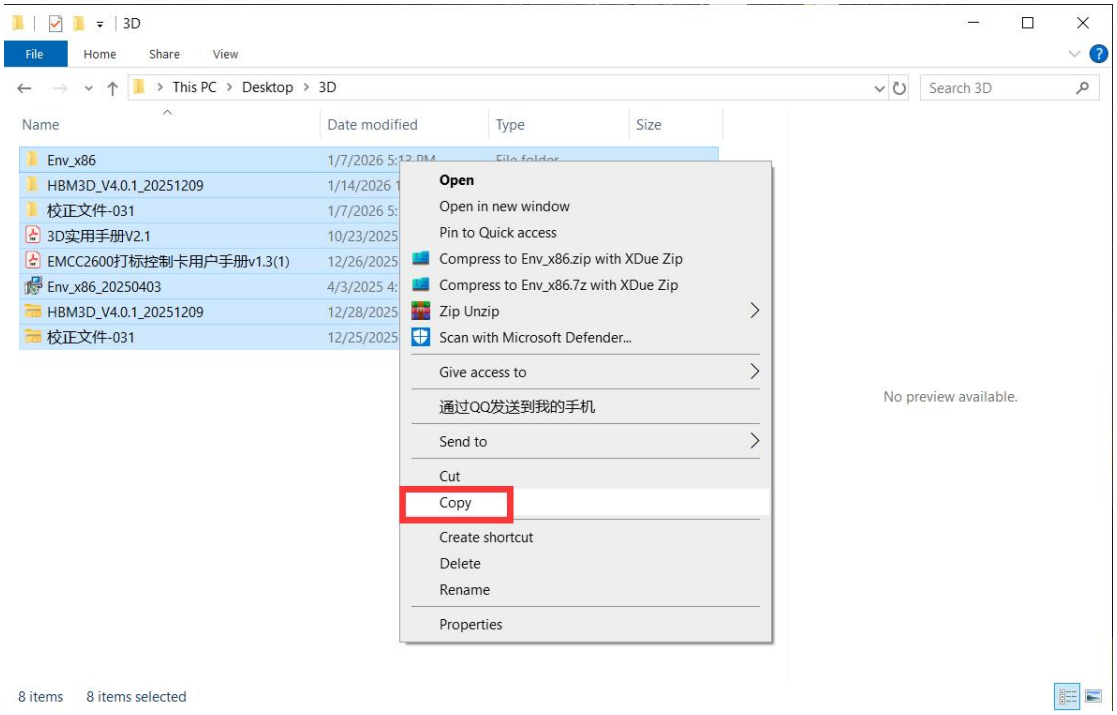


Return to the 3D directory and copy this file.



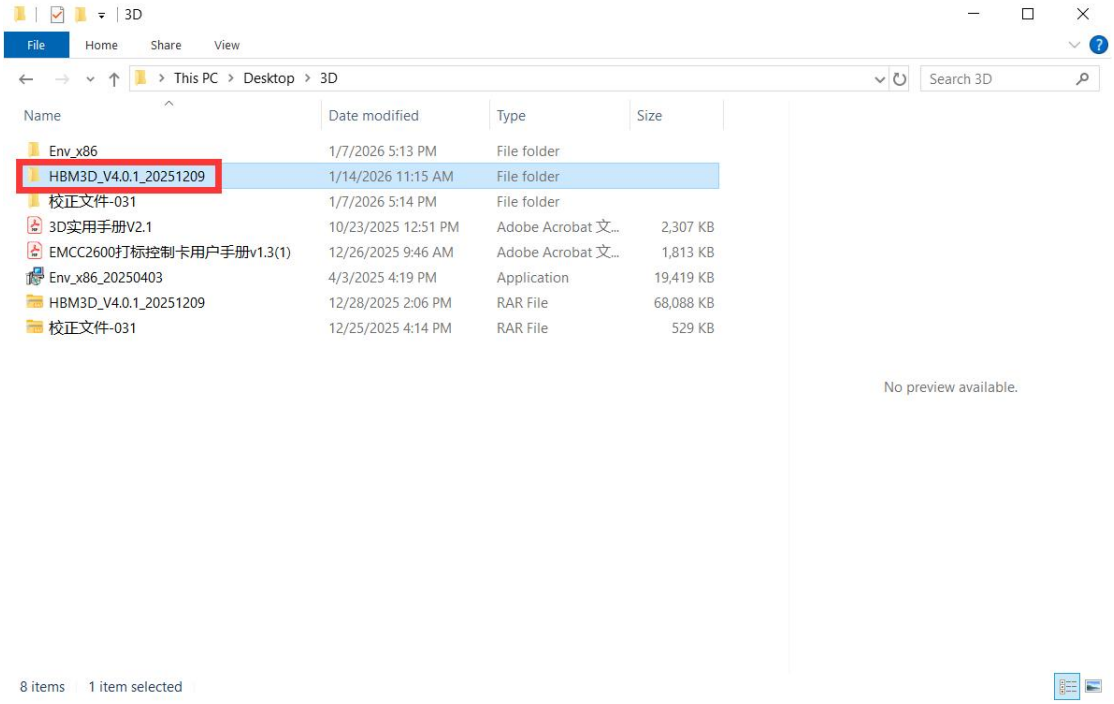
Simply paste the copied zint.dll file into the HBM3D directory.

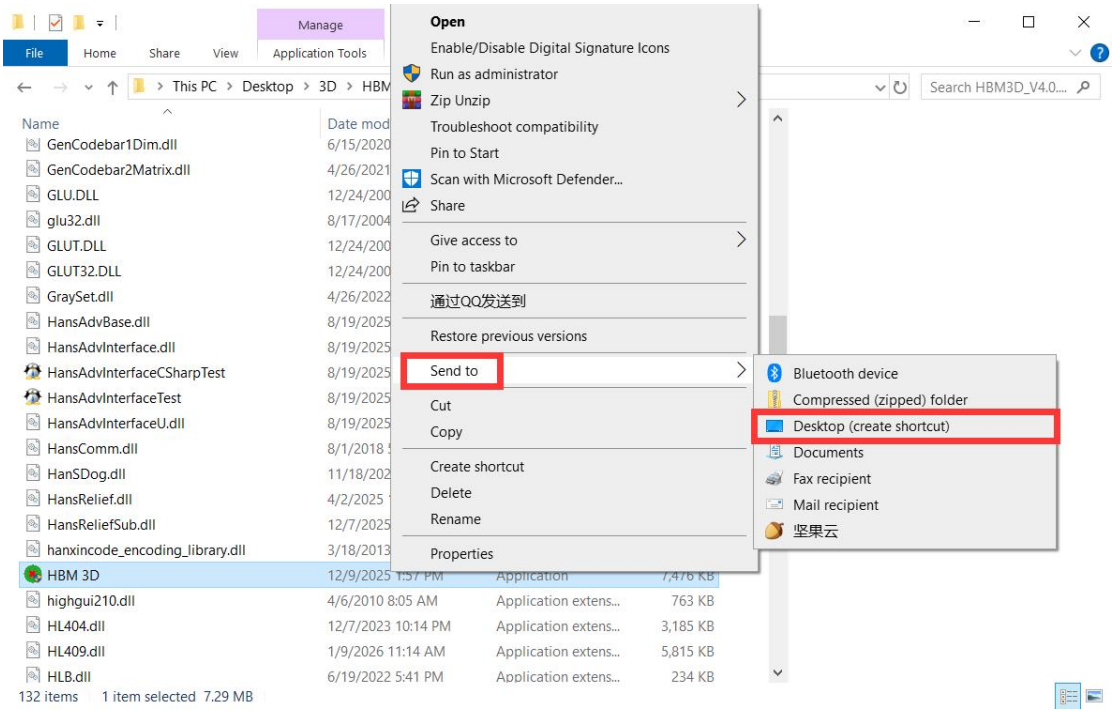
At this point, the USB driver installation is complete.



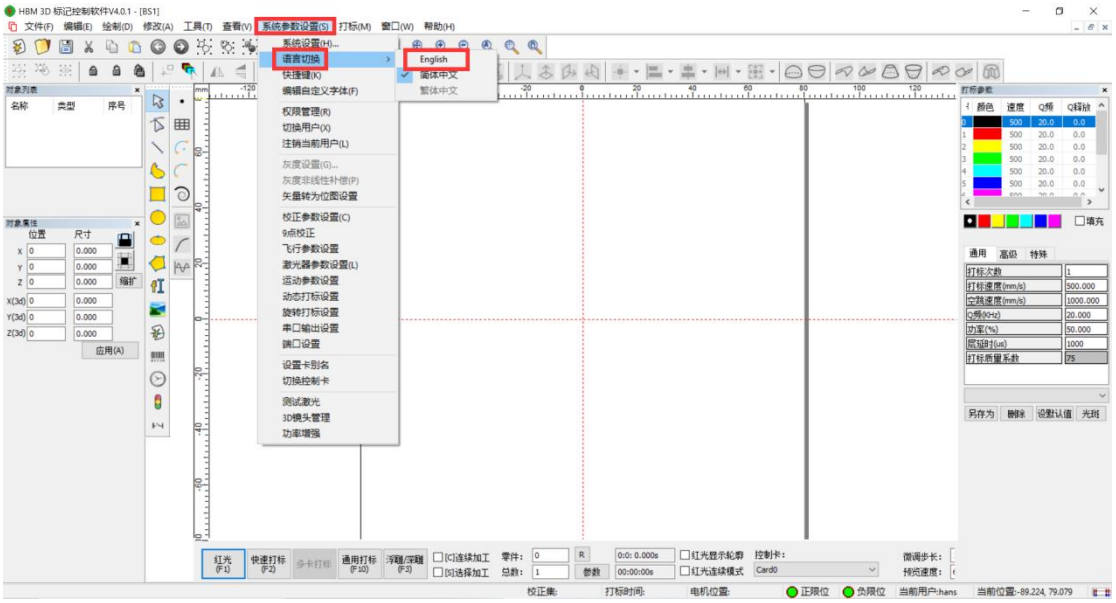
Insert the USB drive and copy and paste the software to a newly created folder on your desktop. Follow the steps circled in the image to find the software and create a desktop shortcut. Once the software is installed, if the interface is in Chinese, follow the steps circled in the image to change it to English. You will need to restart the software for the changes to take effect.

Note: Please insert the dongle USB drive before opening the software.



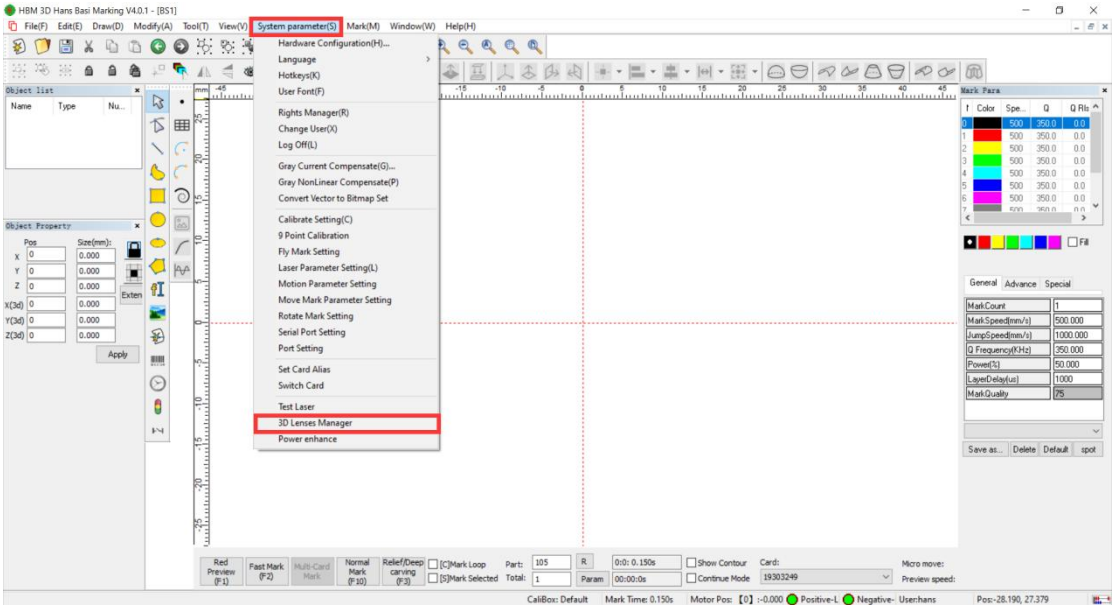


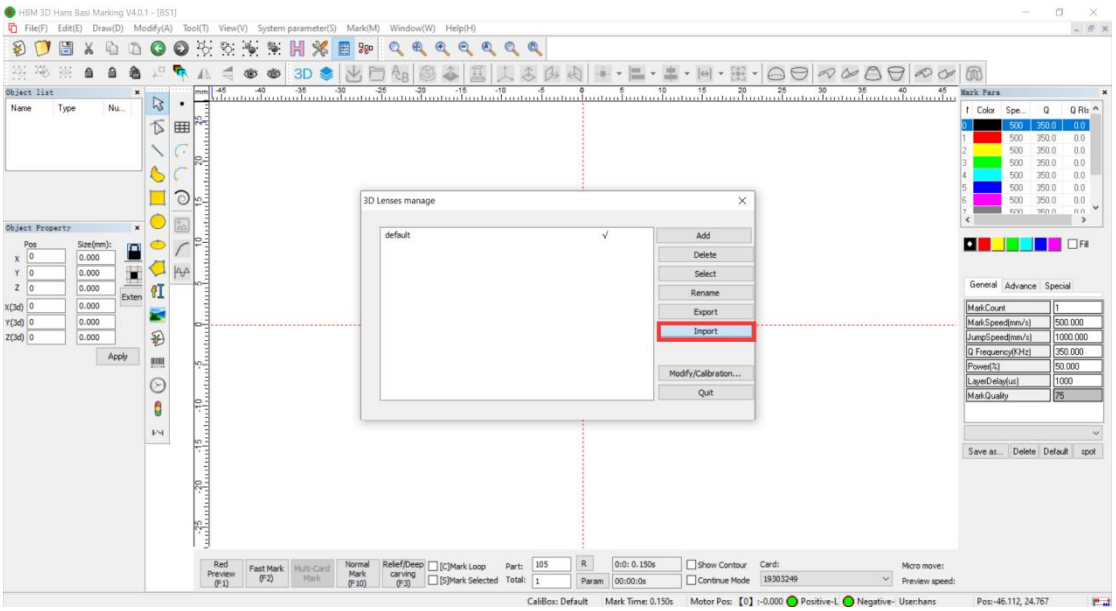
Create a desktop shortcut for the HBM 3D.exe file for later opening. Once this step is complete, the software installation is finished. Below is a tutorial on switching the software to English.

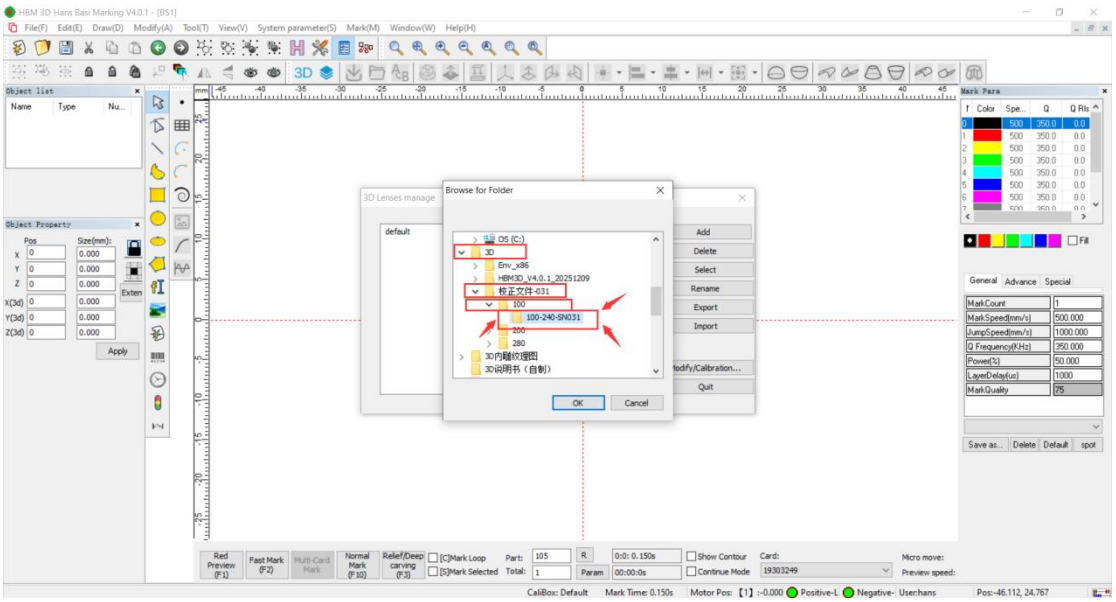


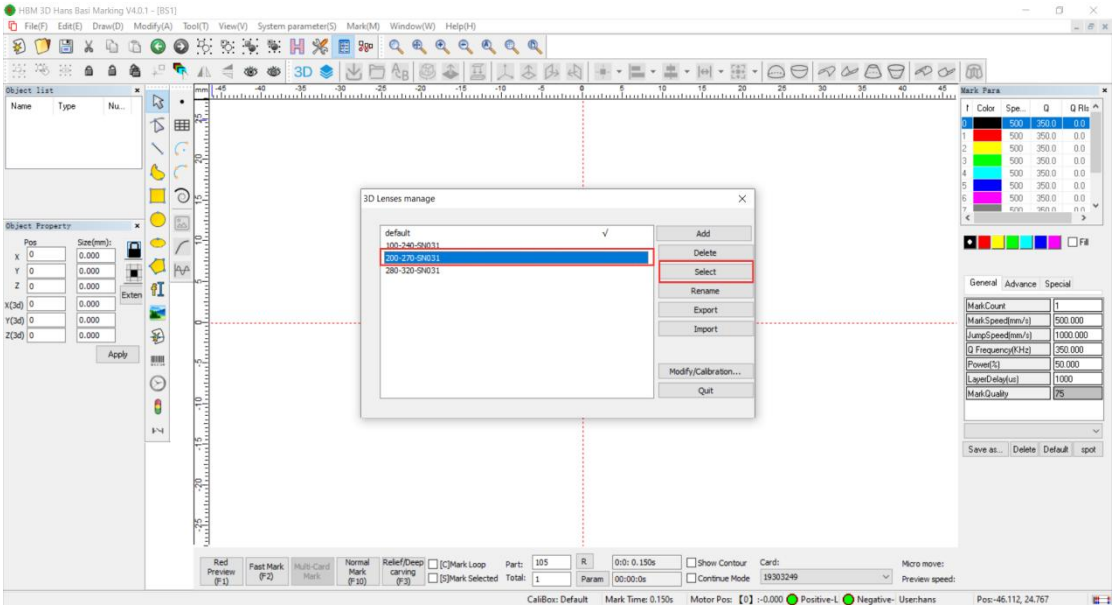
You need to restart the software for the changes to take effect.

6. Importing 3D lens parameters



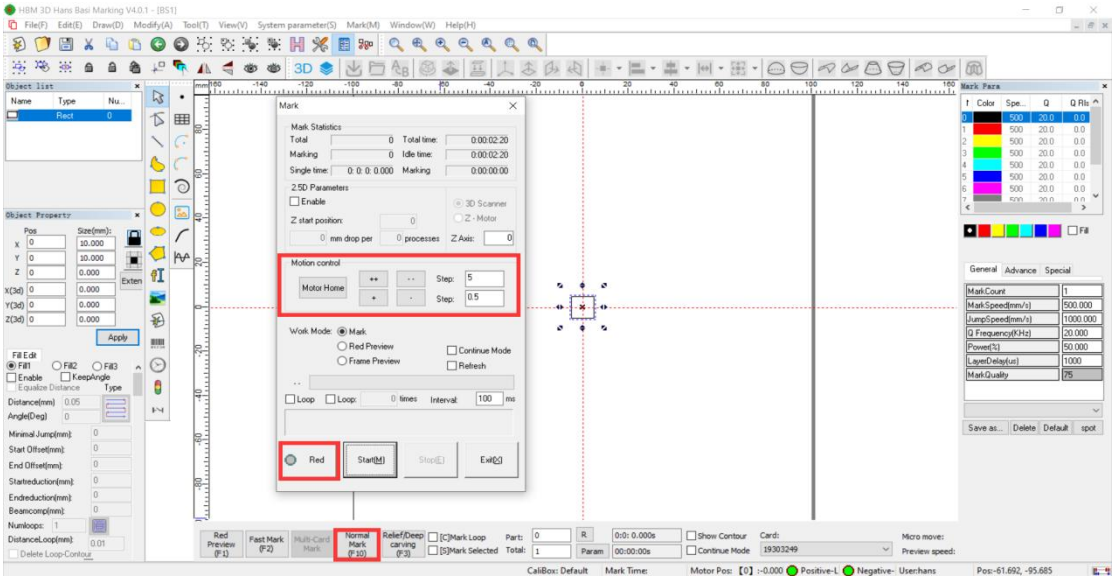

3D Lenses manage
default
Add
Delete
Select
Rename
Export
Import
Modify/Calibration...
Quit


Browse for Folder
OS (C:)
3D
Env_x86
HBMCD_V4.0.1_20251209
校正文件-031
100
100-240-SN031
200
280
3D内雕纹理图
3D说明书（自制）
OK
Cancel


3D Lenses manage
default
100-240-SN031
200-270-SN031
280-320-SN031
Add
Delete
Select
Rename
Export
Import
Modify/Calibration...
Quit

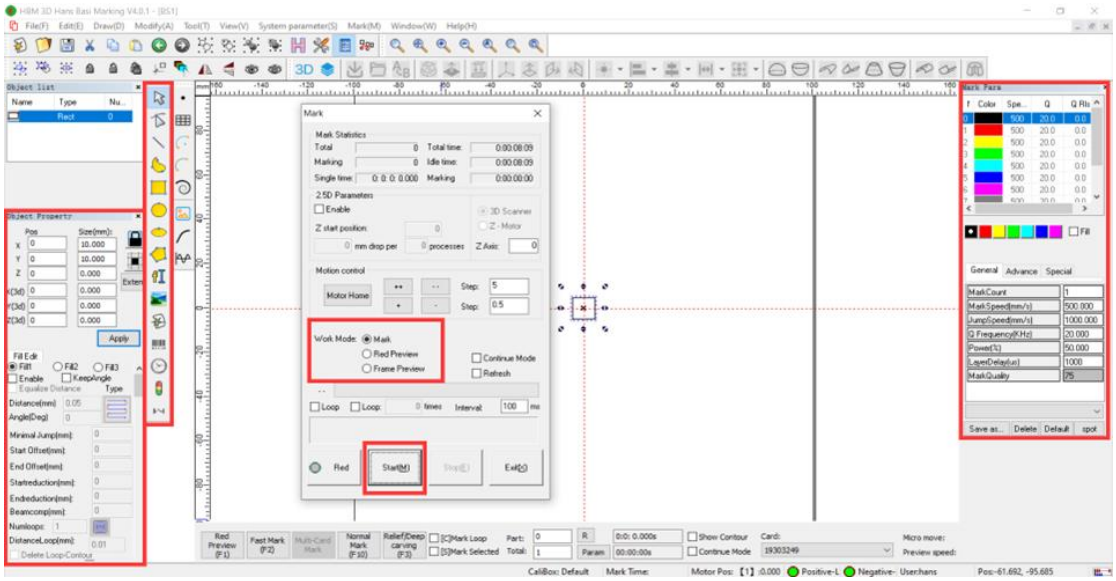
After importing all three lenses, simply left-click to select the 3D lens format you want to use and then click "Select." Once you've made your selection, you can begin the marking process.

7. 2D Marking

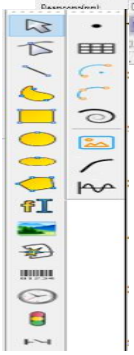


First, place the item to be processed on the workbench, draw any shape, click on Normal Mark, then click on Red to see two red lights: one is the laser red light and the other is the auxiliary focus red light. Then, in the Motion control section, control the Z-axis to make the two red lights coincide, and the first step of focusing is completed.

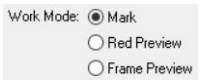
Motor Home is the axis reset function. The axis returns to the position when the machine is tu0rned on and the software is opened. If you want to change it, just change the position and then restart.



The left-hand column allows processed content according  you to adjust the size, position, and fill parameters of the to your needs.

This section allows you to  create drawings and import vector or bitmap images for further processing.

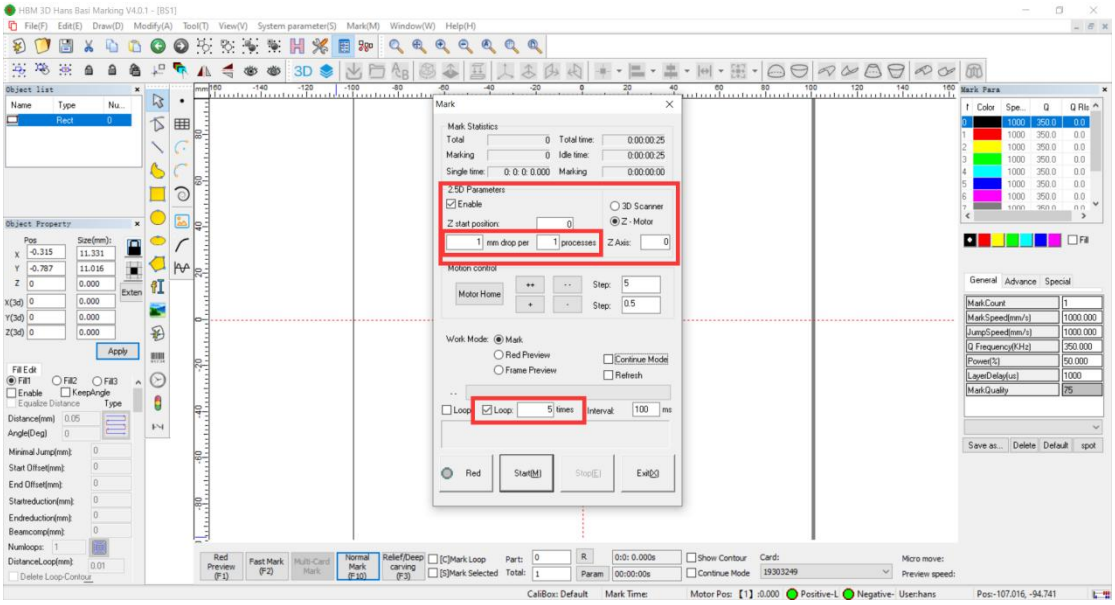
In this section,  select the desired pen number and adjust the processing parameters. Note: Laser frequency adjustment is in General, and pulse width adjustment is in Advance.

After confirming the above parameters and focus position, and ensuring personal safety, select the red light position, 

then select Mark mode and click START 

to begin marking.

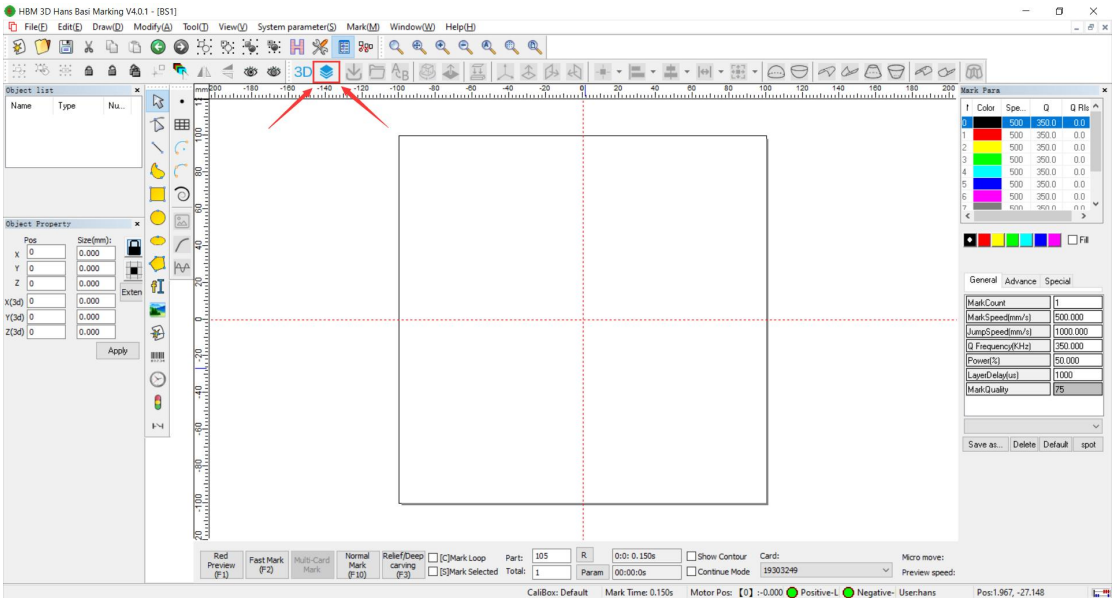
8. Simplified 2.5D mode

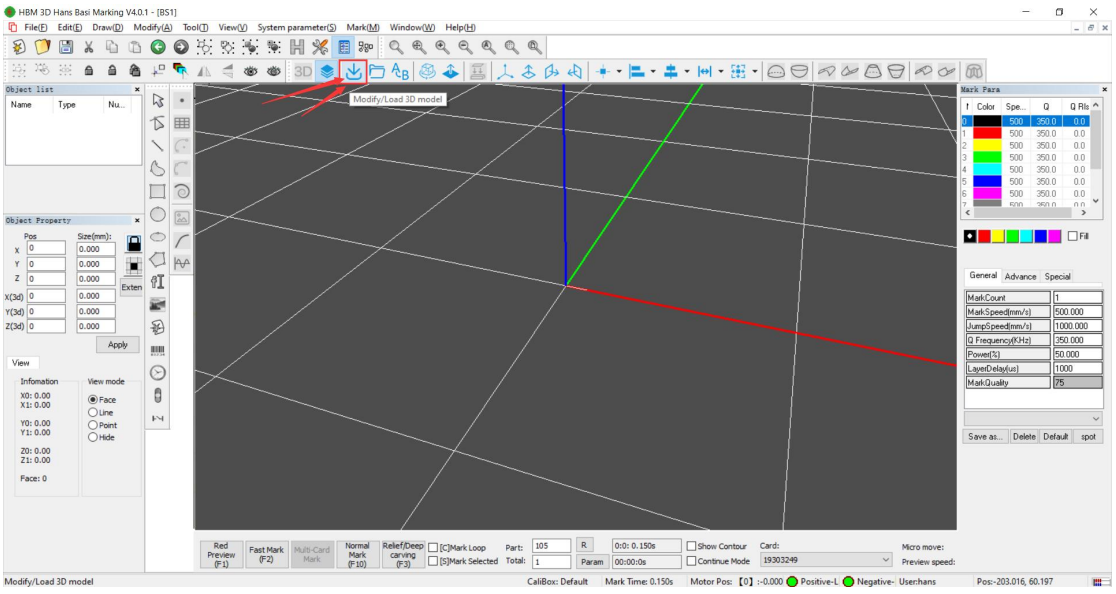


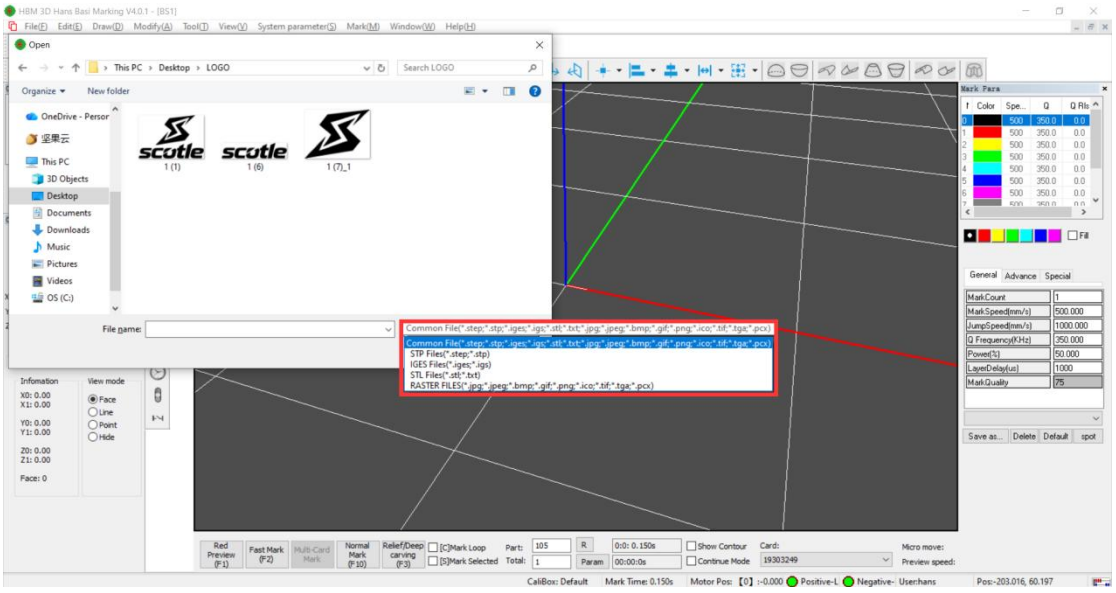
To achieve a marking motion along the Z-axis with each mark, check the box here and set the parameters for how many marks to make and how many millimeters to move. Then, check the "LOOP" box on the right and enter the desired number of markings. For example, my setting is to move the Z-axis upwards by 1mm after each mark and then continue marking.

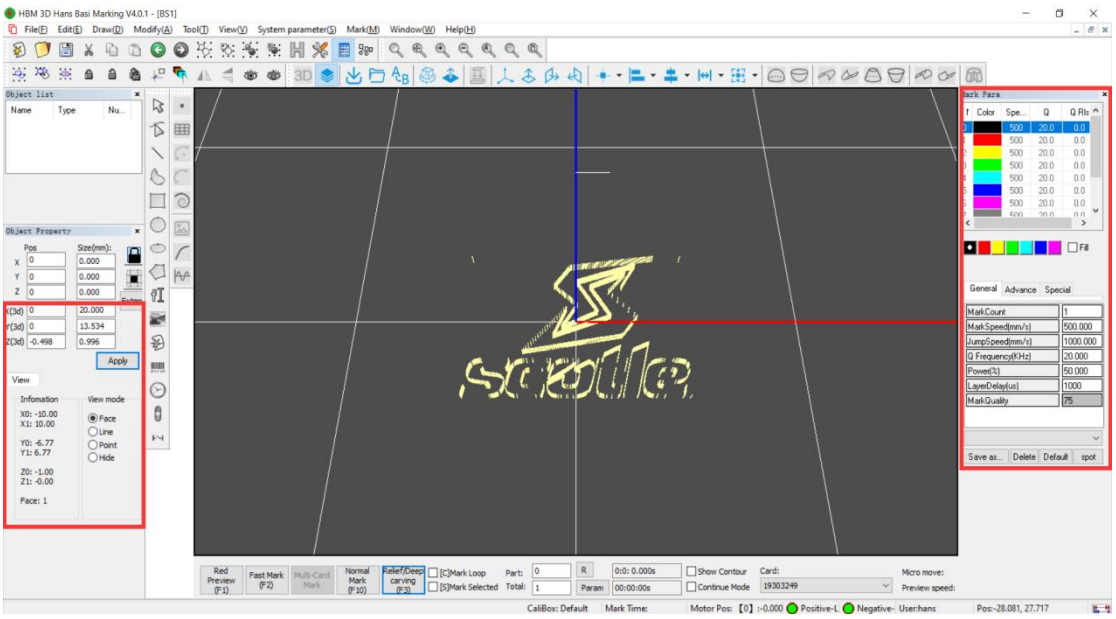
9. 2.5D Intaglio/Relief Carving

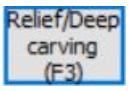
9.1 2.5D Intaglio Sculpture (Bitmap Mode)

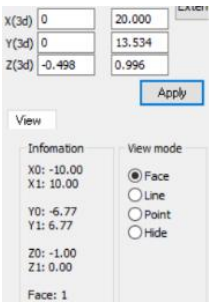



Modify/Load 3D model


Open
This PC
Desktop
LOGO
Search LOGO
Organize
New folder
OneDrive - Personal
坚果云
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
OS (C:)
1 (1)
1 (6)
1 (7)_1
File name:
Common File(*.step;*.stp;*.iges;*.igs;*.stl;*.txt;*.jpg;*.jpeg;*.bmp;*.gif;*.png;*.ico;*.tif;*.tga;*.pcx)
STP Files(*.step;*.stp)
IGES Files(*.iges;*.igs)
STL Files(*.stl;*.txt)
RASTER FILES(*.jpg;*.jpeg;*.bmp;*.gif;*.png;*.ico;*.tif;*.tga;*.pcx)

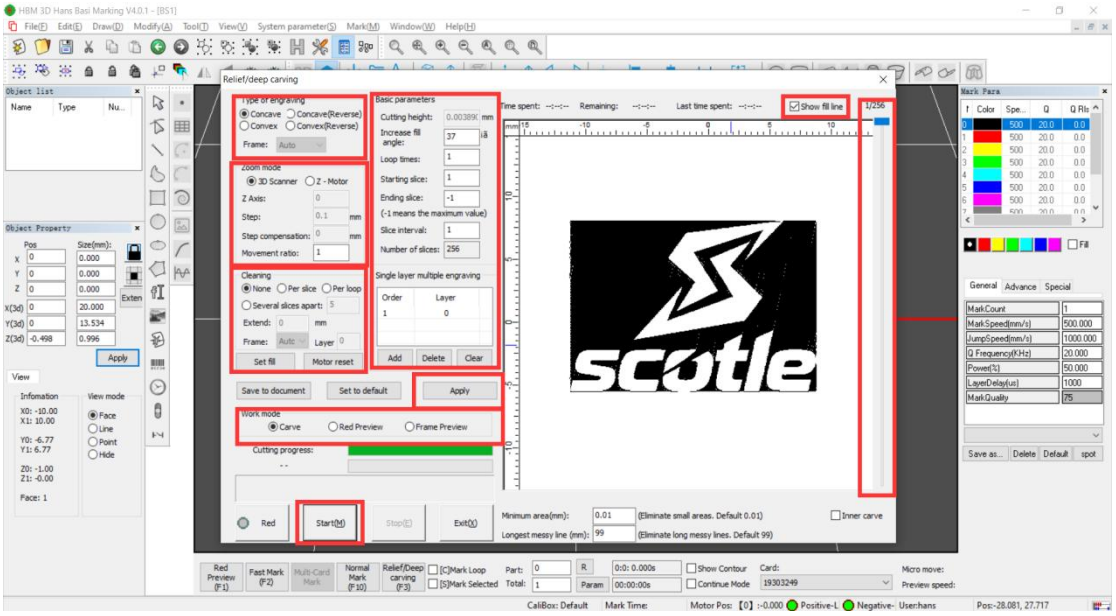


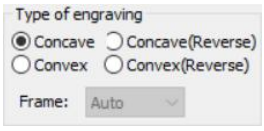
Click the button below/F3 to enter the engraving interface. 

This section adjusts the size, position, 

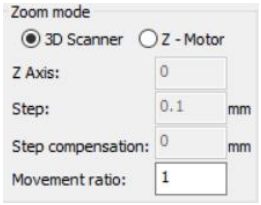
and viewing method of the 3D view.

This section  allows you to select the pen size and adjust the parameters for 2.5D sculpting.

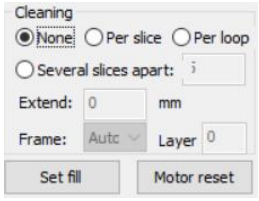




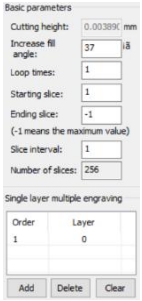
Here you can choose the carving type, such as intaglio or relief carving. Choosing the reverse will result in a smoother finish, but some details will be lost.



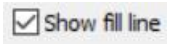
Here, the first zoom option is 3D galvanometer zoom, and the second is Z-axis zoom. Choose according to your needs. For a detailed explanation, please refer to the section on 3D zoom and Z-axis zoom.



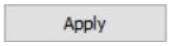
This is where you set up the cleaning process. Cleaning involves scanning the entire surface of the graphic after each engraving to remove impurities. The two options below are for the fill settings: a smaller fill setting results in slower printing but a finer finish, while a larger fill setting results in faster printing but a coarser finish. There's also a motor reset button.



This section contains settings for the number of cutting layers, the start and end points for carving, the layer jump settings, and the single-layer multi-carving mode.

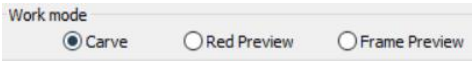


This shows the area to be sculpted after the fill line option is checked.



You need to click Apply every time when set the parameters.

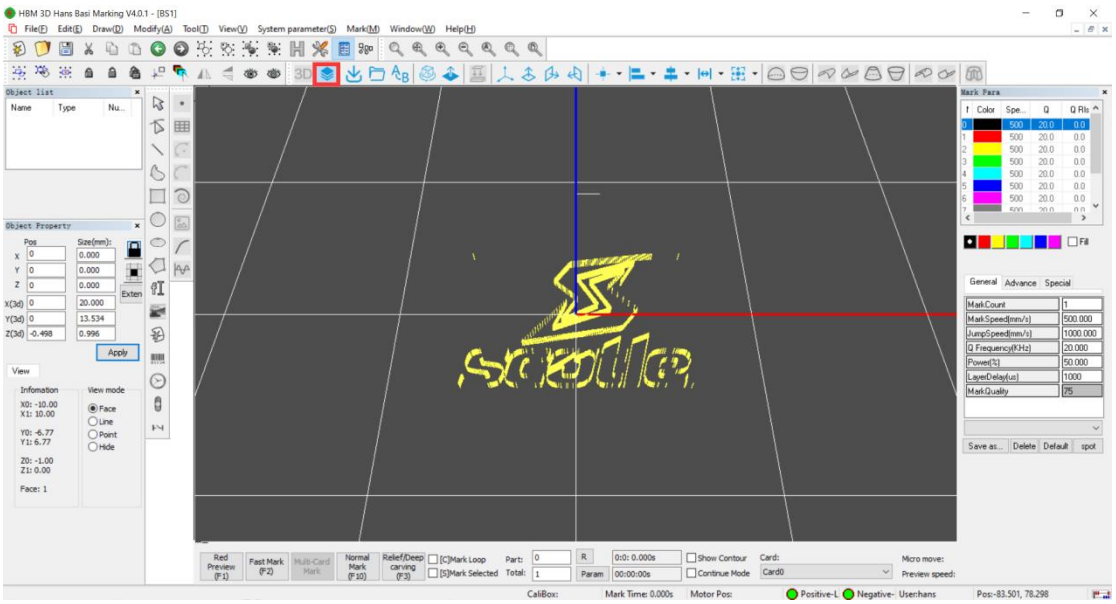
Slide this button to view the number of layers, the carving direction of each layer, and the content.



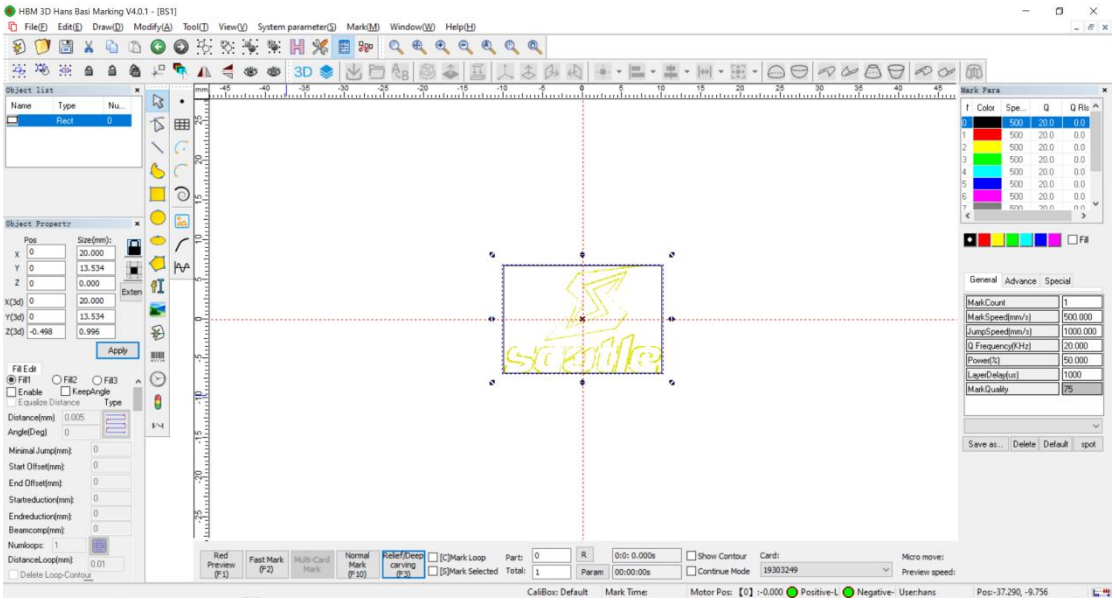
This is where you select the work mode. There are three options: engraving, red light preview, and border preview. After selecting, you need to click "Start" below for the effect to take place. Select "Engraving" and then click 

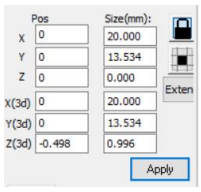
so it will then emit light and automatically carve.

9.2 2.5D relief sculpture

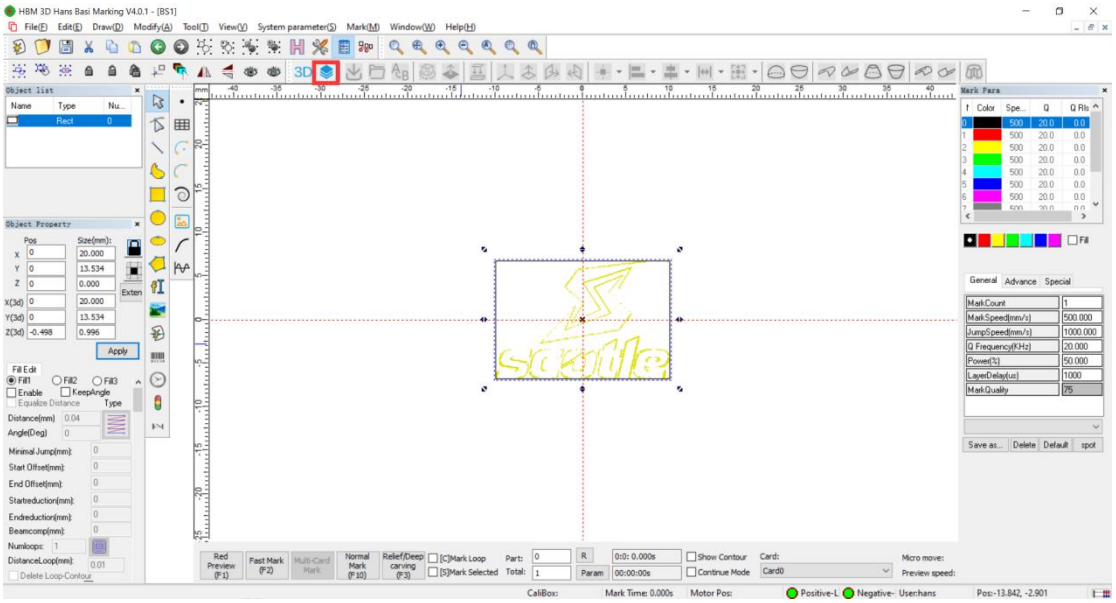


Click  Return to 2D mode view

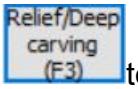




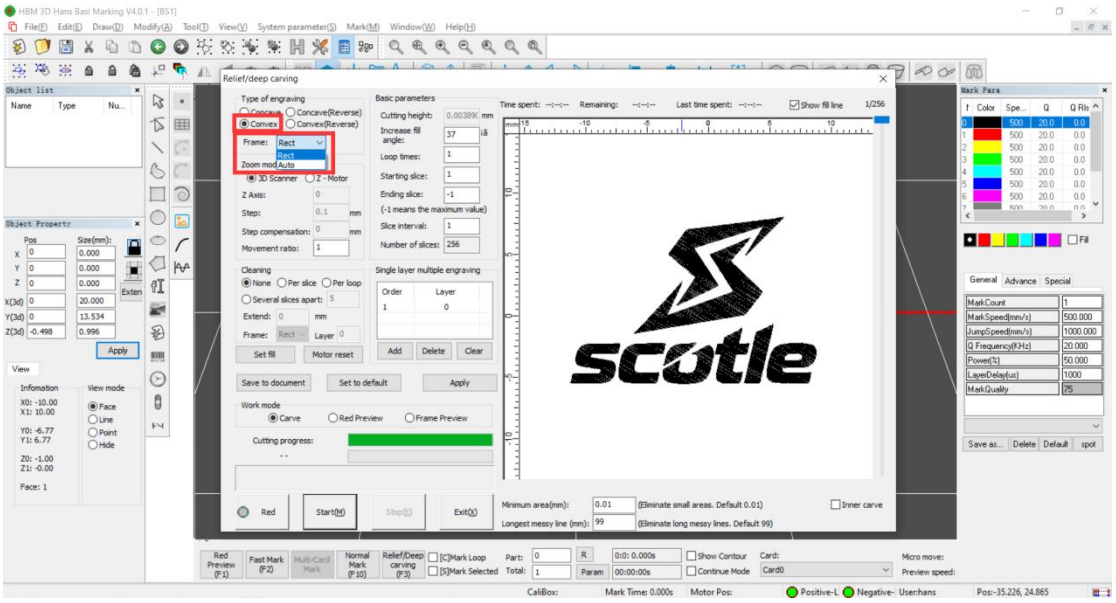
Draw a closed shape that can select the carving content. Shapes without the .3D suffix are for adjusting the properties of the drawn shape, while those with the .3D suffix are for adjusting the properties of the carving content. Pay attention to the difference. Then, align the coordinates of the drawn shape with the coordinates of the carving content. This step prepares for the subsequent relief carving.



After drawing and resizing, click  again, Switch back to the 2.5D view interface

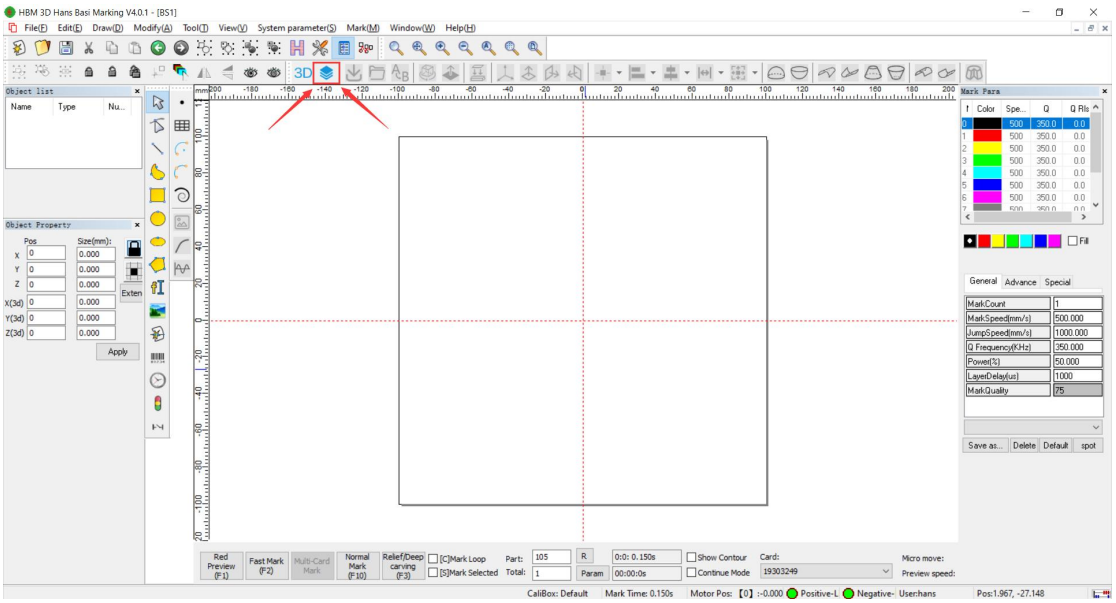
Click the button below/F3 

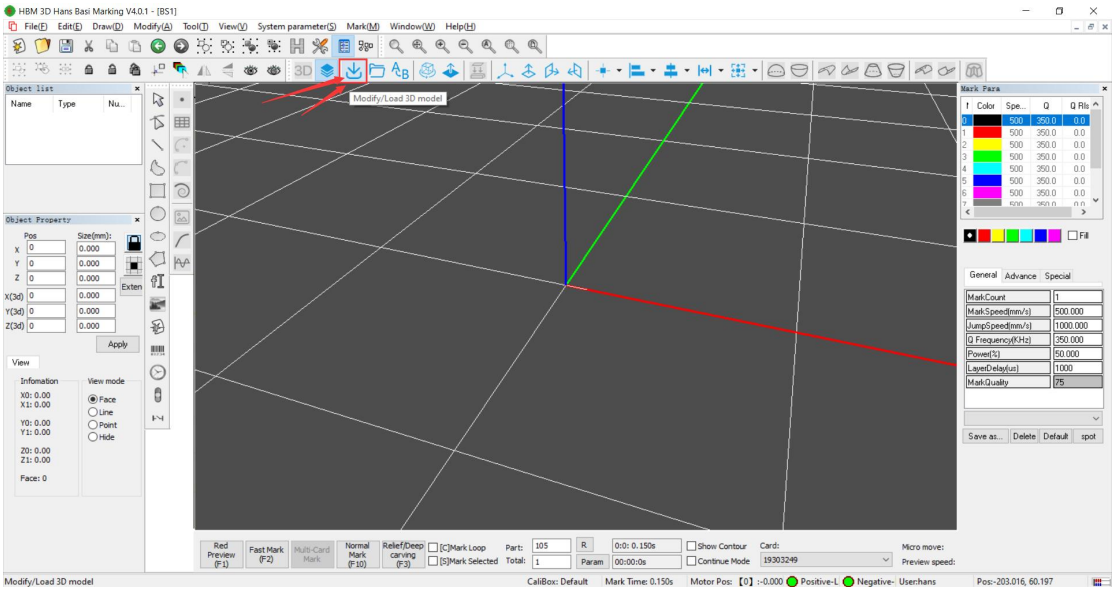
to enter the engraving interface.

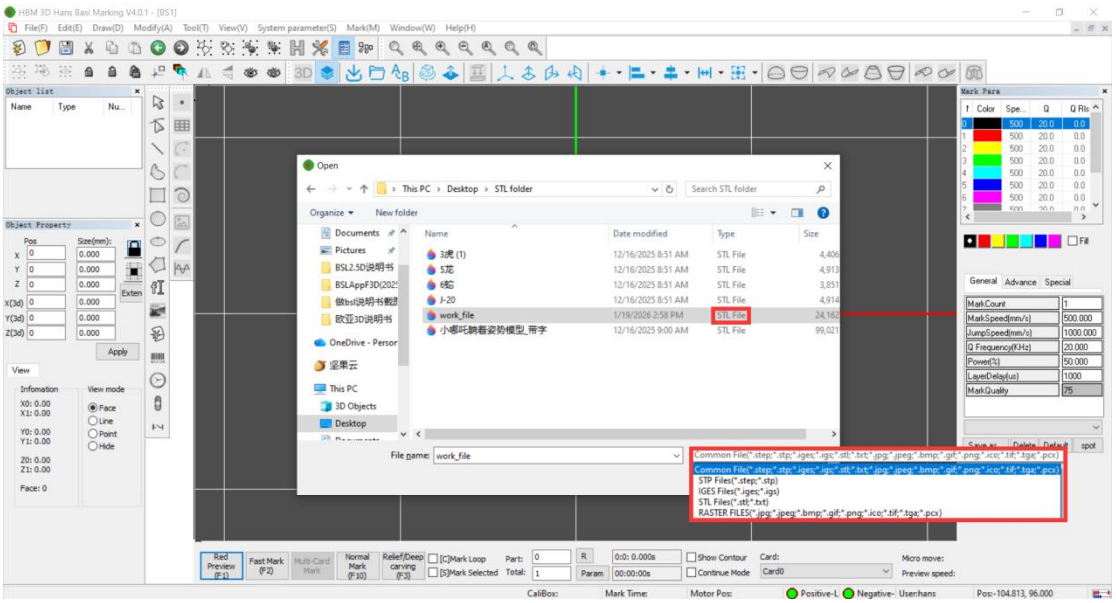


The only difference is this: the box I just drew. It usually selects automatically; just apply it. This is how you create a relief carving effect, which is the opposite of the intaglio carving effect above. That's it! The parameters are the same as in the intaglio carving tutorial above. After confirming the parameters, select the carving mode and click to start the carving process automatically.

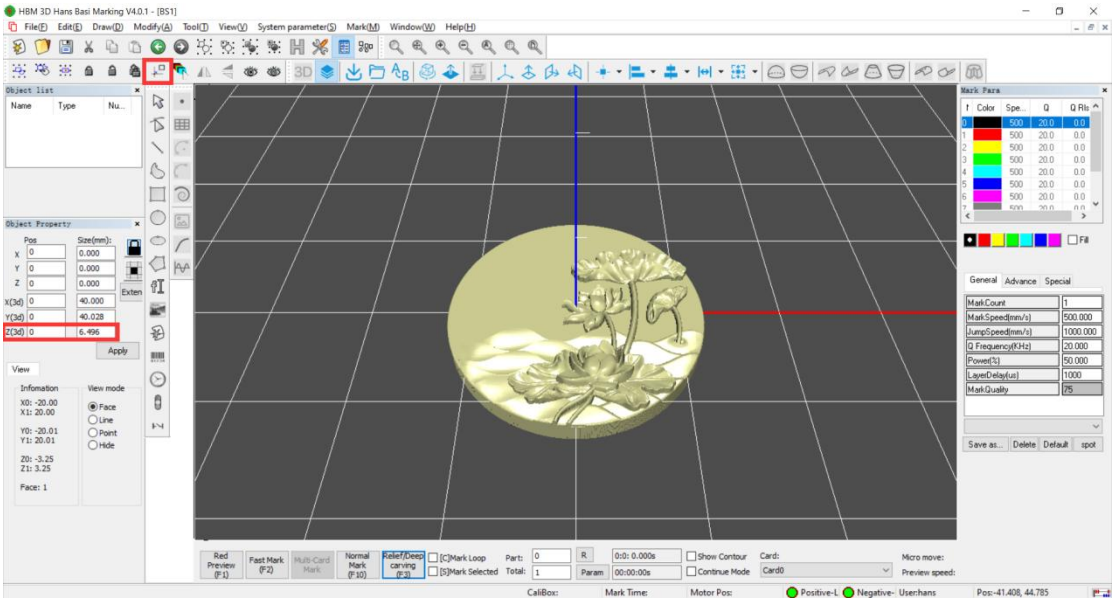
9.3 2.5D negative sculpting (3D file mode)

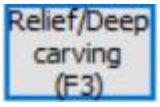




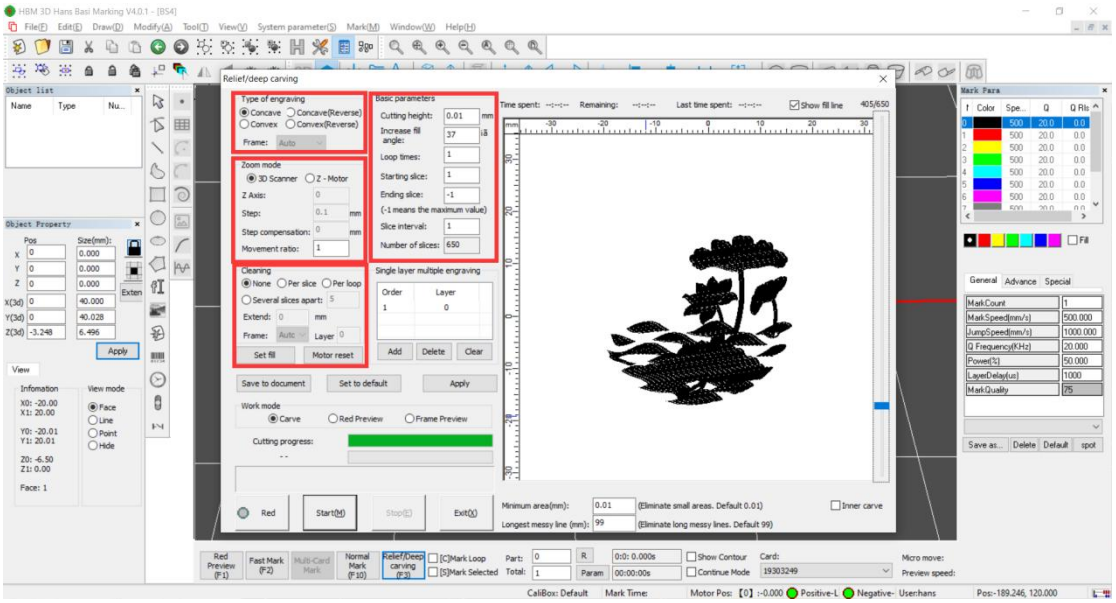


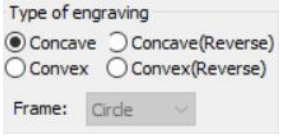
This page displays the formats for importing 3D models; I selected the .STL format.



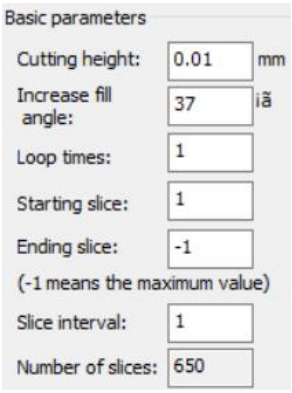
After importing, click "Center" for easier positioning later. Set the Z-axis coordinate to half the height of the 3D model and enter a negative value. For example, if the Z-axis model height is 6.496mm, then the coordinate should be set to -3.248. After setting, click 

enter carving slicing mode.

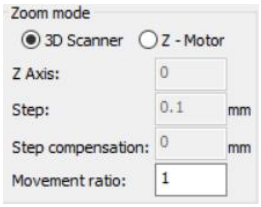




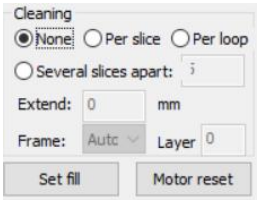
In negative sculpting mode, the forward mode slices the 3D model from bottom to top, while negative sculpting (reverse) slices from top to bottom. Positive sculpting is the reverse: the forward mode slices from top to bottom, and the positive sculpting (reverse) slices from bottom to top. Choose the mode that best suits your sculpting needs.



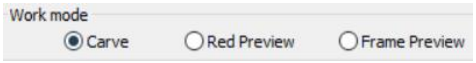
A smaller cut height setting results in more layers being cut, but a longer processing time. Conversely, a larger setting results in fewer layers being cut, but a shorter processing time. Only 3D models allow setting the cut height; if a bitmap model needs to be thicker, the only solution is to increase the Z-axis height of the 3D model.



Here, the first zoom option is 3D galvanometer zoom, and the second is Z-axis zoom. Choose according to your needs. For a detailed explanation, please refer to the section on 3D zoom and Z-axis zoom.



This is where you set up the cleaning process. Cleaning involves scanning the entire surface of the graphic after each engraving to remove impurities. The two options below are for the fill settings: a smaller fill setting results in slower printing but a finer finish, while a larger fill setting results in faster printing but a coarser finish. There's also a motor reset button.

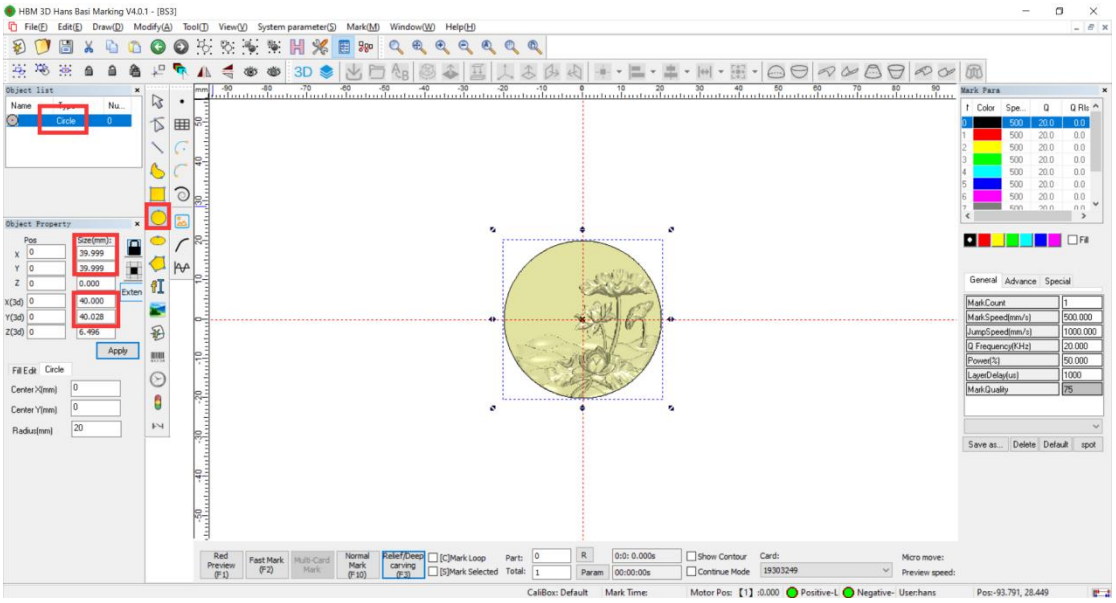


This is where you select the work mode. There are three options: engraving, red light preview, and border preview. After selecting, you need to click "Start" below for the effect to take place. Selecting "Engrave" and clicking 

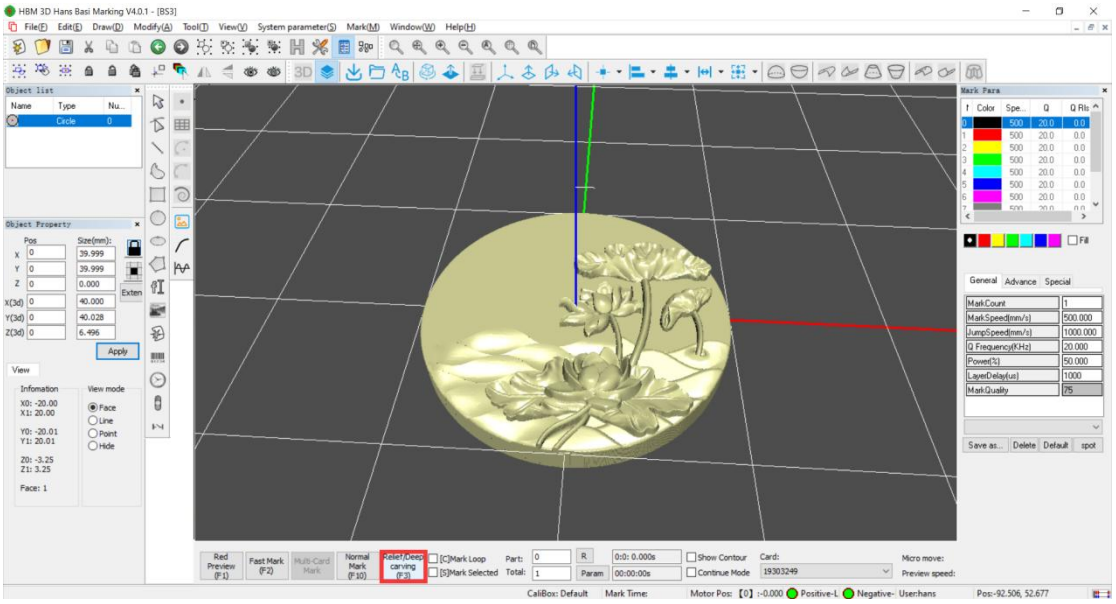
again will activate the automatic engraving process.

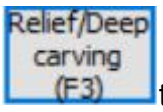
9.4 2.5D relief carving (3D file mode)

Click  to return to the 2D mode view

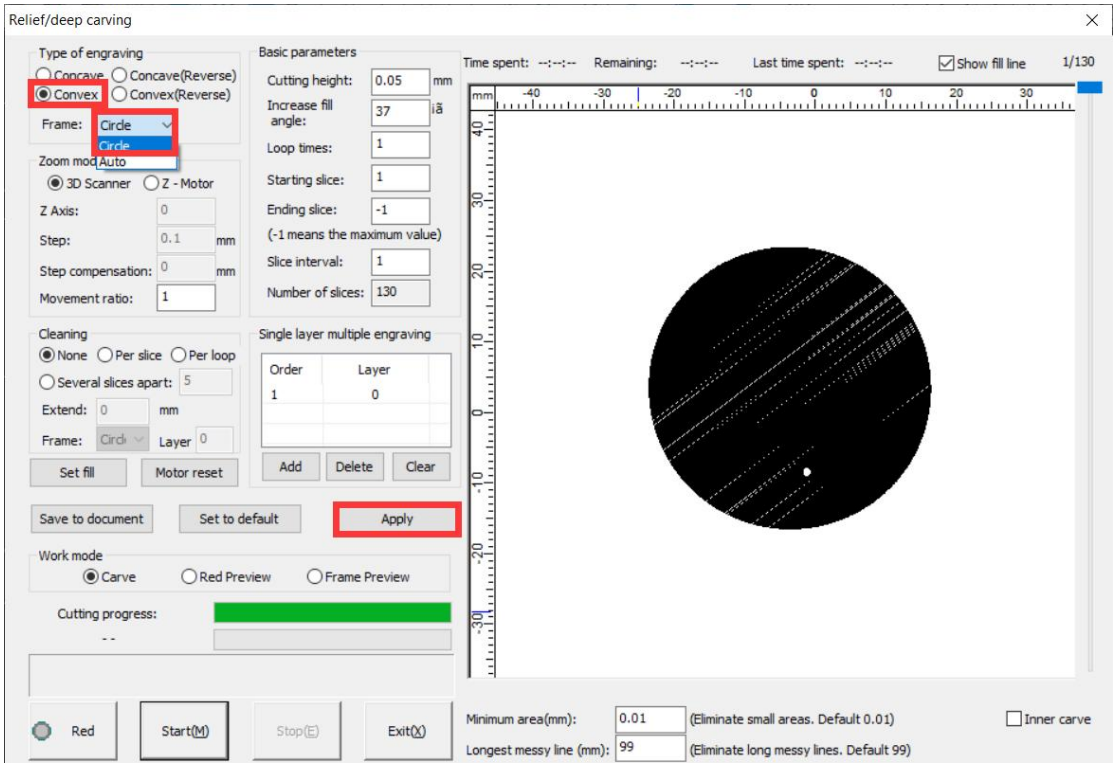


Draw a shape the same size as the carving content. If the carving content is circular, draw a circle; if it's rectangular, draw a rectangle. Align the drawn shape with the carving content (using the same coordinates), then click  to return to the 2.5D view interface.



Then click 

to enter the carving and slicing mode.

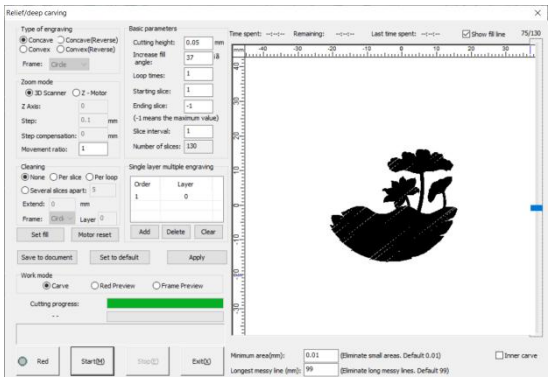


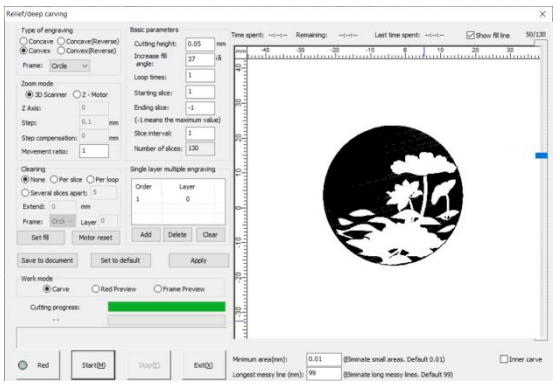
After selecting positive carving, select the circle we just drew. The carving slice content will be automatically generated. Once the parameters and slice are correct, select

and click 

to start carving.

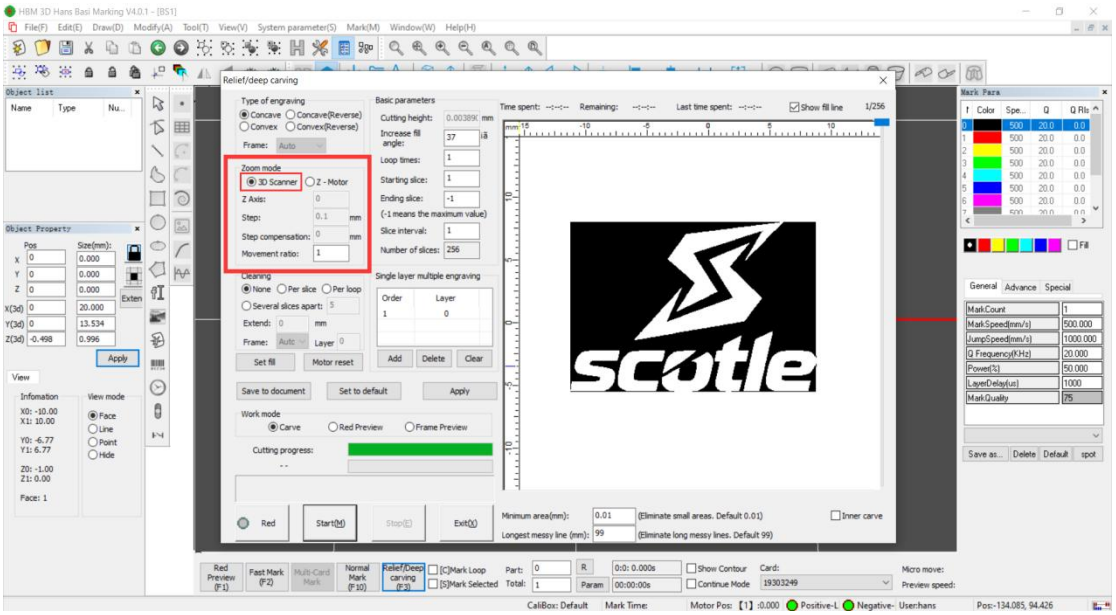
9.5 The difference between intaglio and relief carving



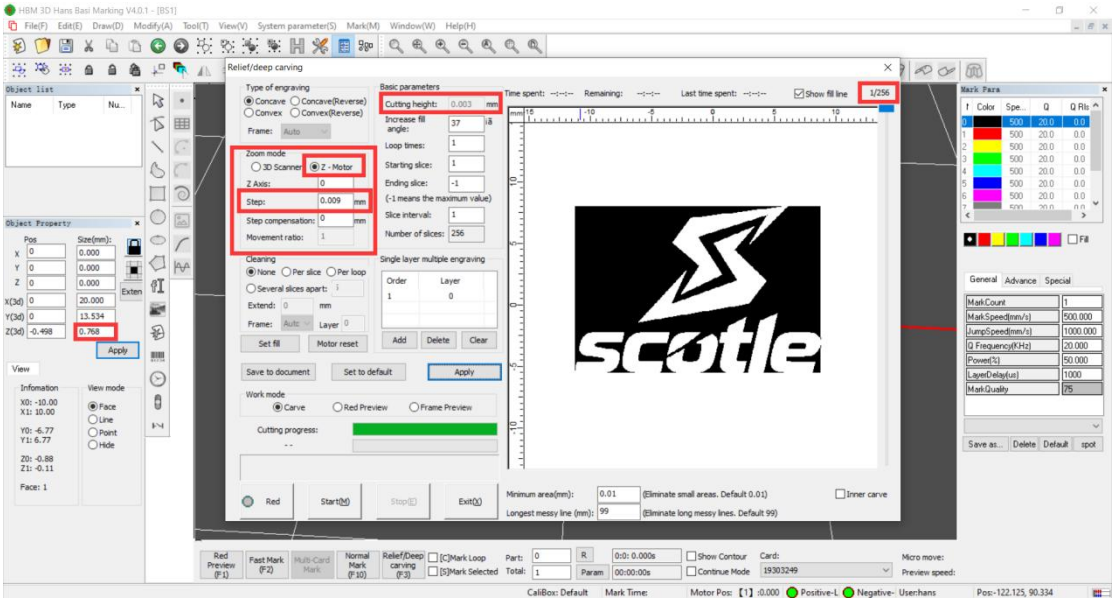


10. 3D variable focus and Z-axis variable focus

10.1 Bitmap mode

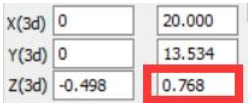


The first type is 3D lens zoom. As the name suggests, during deep engraving, the internal lens module adjusts its position as the engraving layer count increases, thereby altering the focal point. This creates greater dimensionality in deep engravings. Only one parameter can be modified: the movement ratio. For instance, setting it to 0.8MM means that for every theoretical 1MM of movement, the actual movement is 0.8MM.



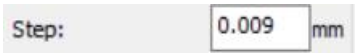
This cutting height 

, JPG mode cannot be modified.

His value is related to the Z-height 

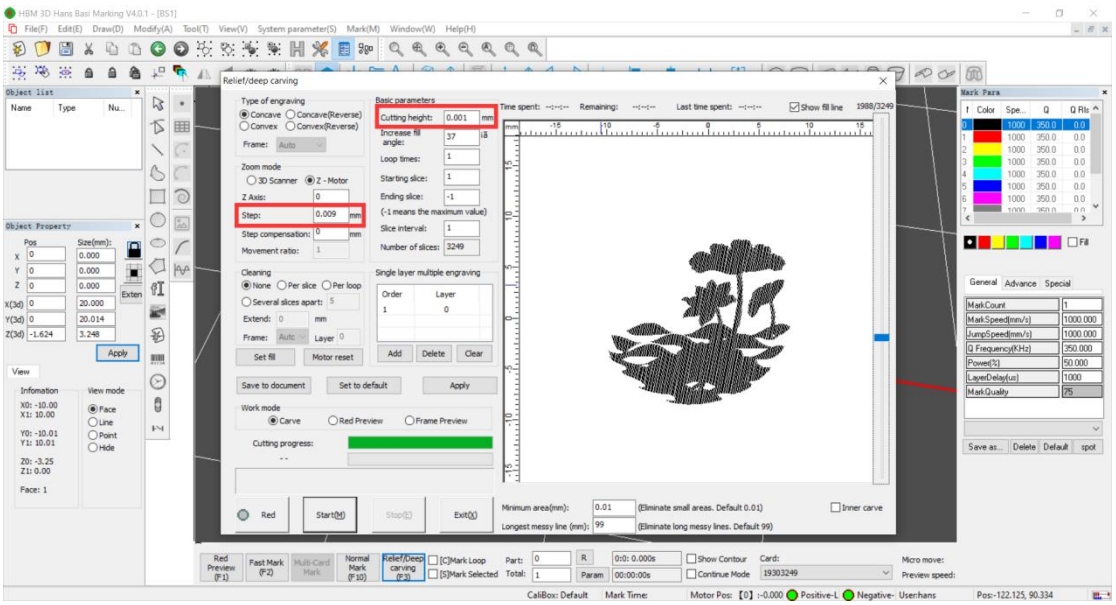
of the 256-layer 

model and the imported 2D model converted to 3D.
Its value is the Z (3D) value divided by 256, which gives a cutting height of 0.003.



This value is called the step distance. The current setting is 0.009. If the layer height is 0.003, then it means that every three layers, the step distance is 0.009. A positive value means moving upwards, and a negative value means moving downwards. Normally, for internal carving aiming at texture, a negative value means moving downwards while simultaneously pressing the axis.

10.2 3D file mode



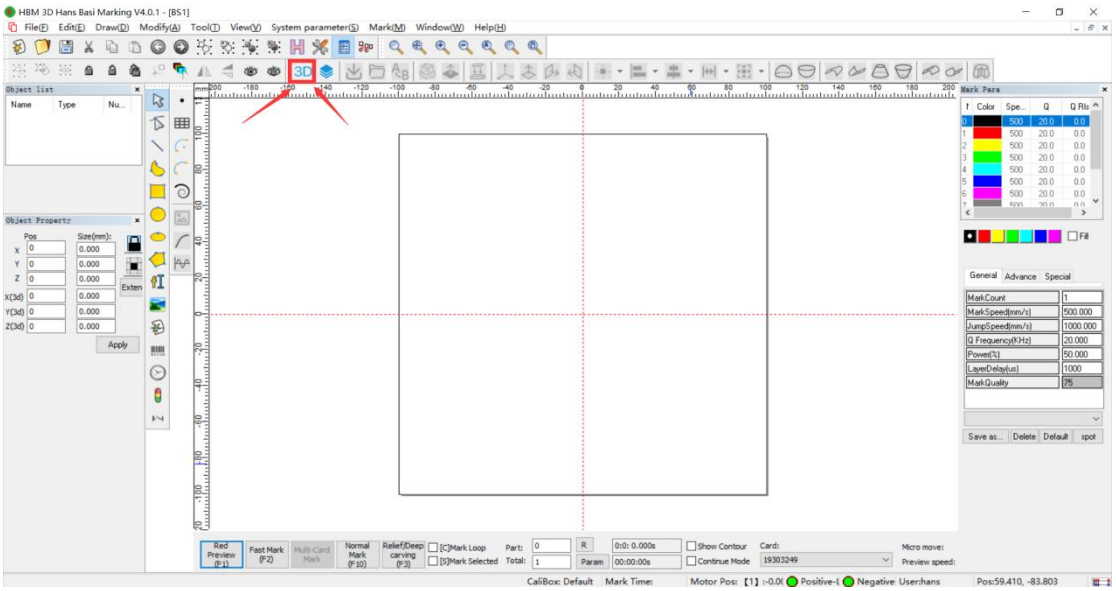
If the imported format is 3D, you can change the layer height of the slice.

The smaller the layer height, the finer the slice, and the larger the total layer height. Conversely, the larger the layer height, the coarser (faster) the slice, and the smaller the total layer height.

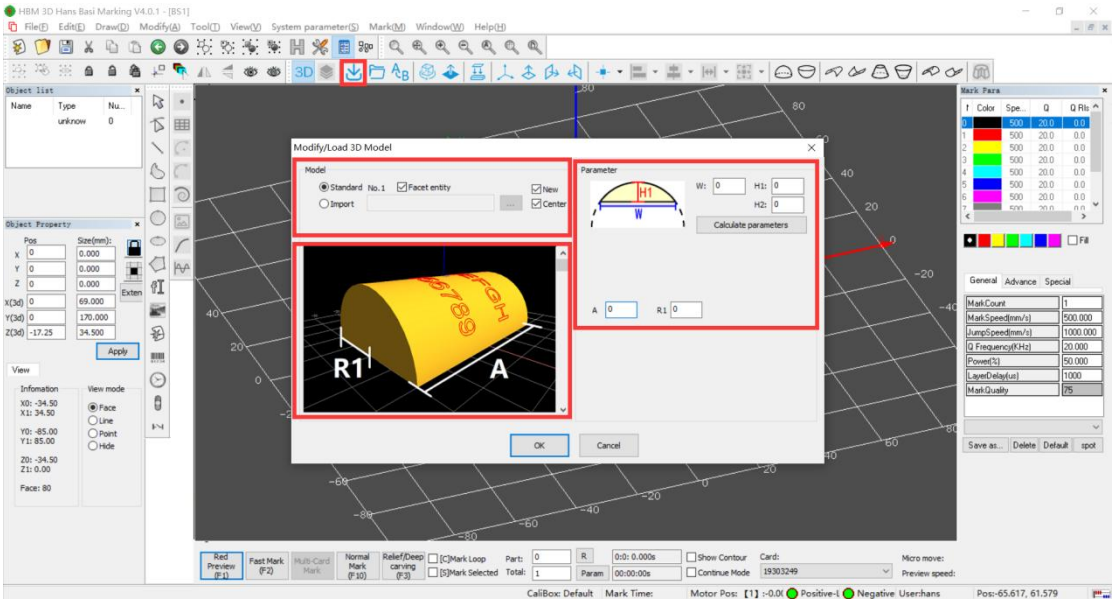
Setting the step size here results in more frequent movement, which means the corresponding laser parameters need to be increased. Conversely, setting it larger results in less frequent movement, but allows for more detailed engraving, and the laser power does not need to be as high. For example, the image shows 0.009 and a layer height of 0.001, which means that the Z-axis moves once every 9 cuts, and the distance is 0.009mm.

11. 3D Marking

11.1 3D Marking Modeling

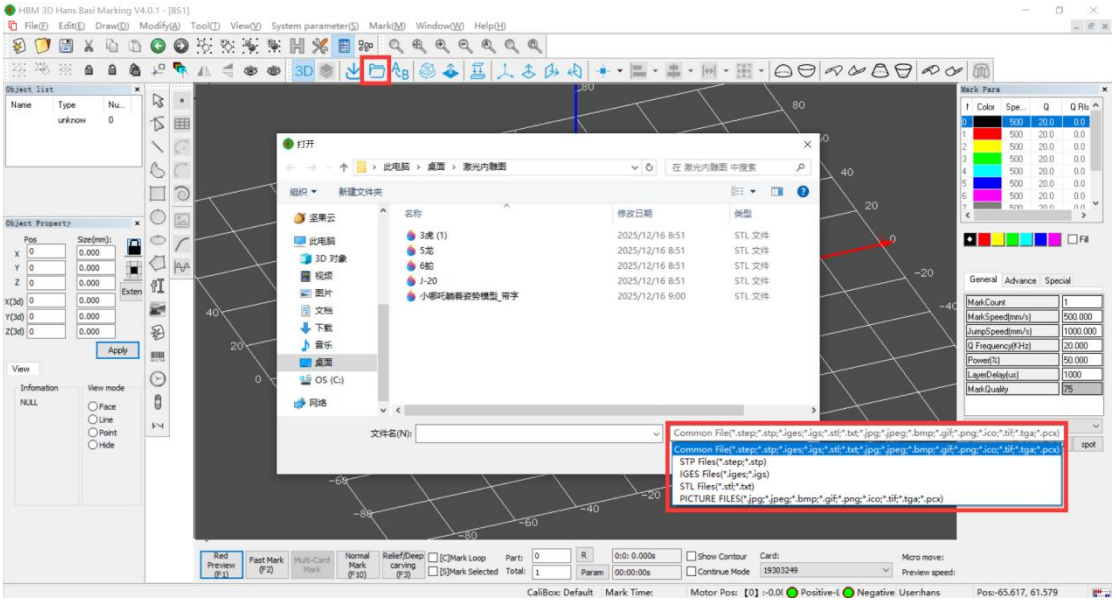


This is a labeling method without a self-built 3D model. It's used when you don't have a 3D model of the target object. First, click 3D

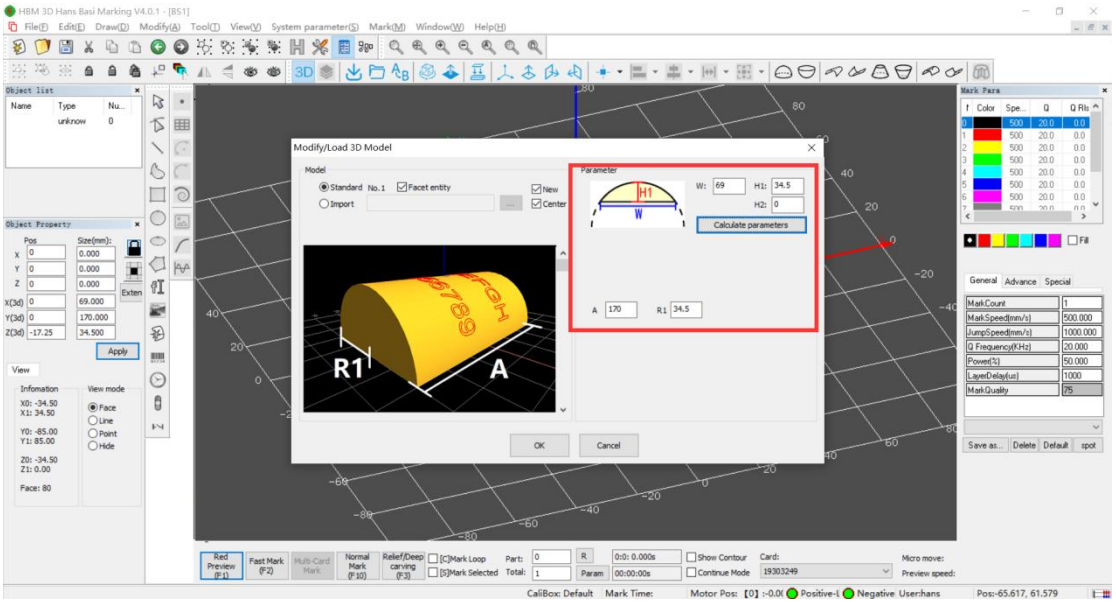


After clicking  this step involves filling in the parameters of the working model, such as the radius, diameter, and overall length.

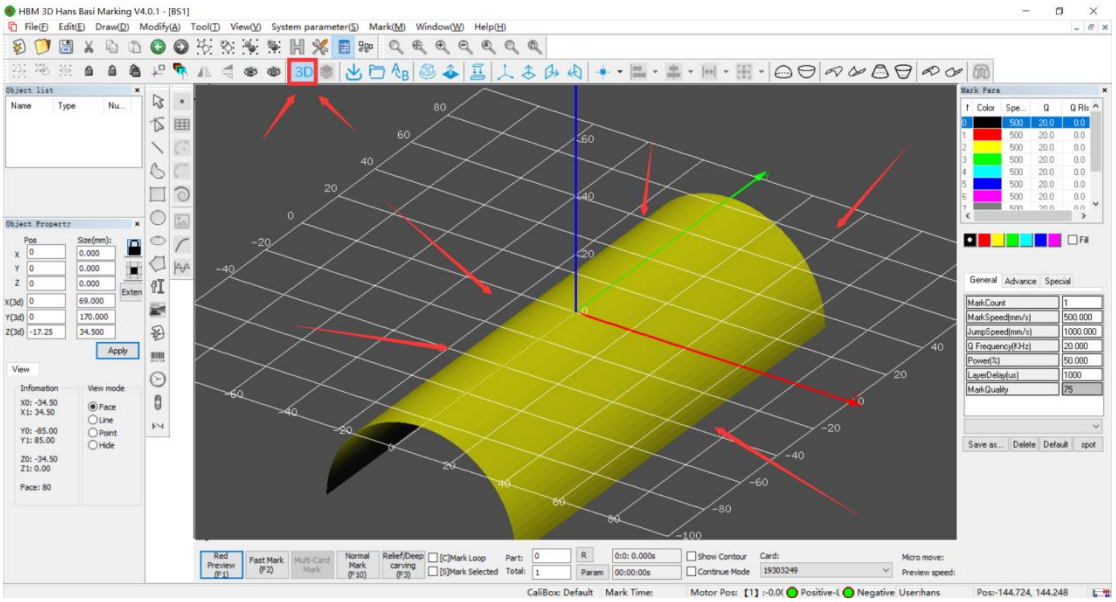
This section allows you to select models from the software's built-in models, or to import 3D models using the "Import" option below. We'll discuss this later; for the custom-built models we're currently using, we don't need to worry about it.



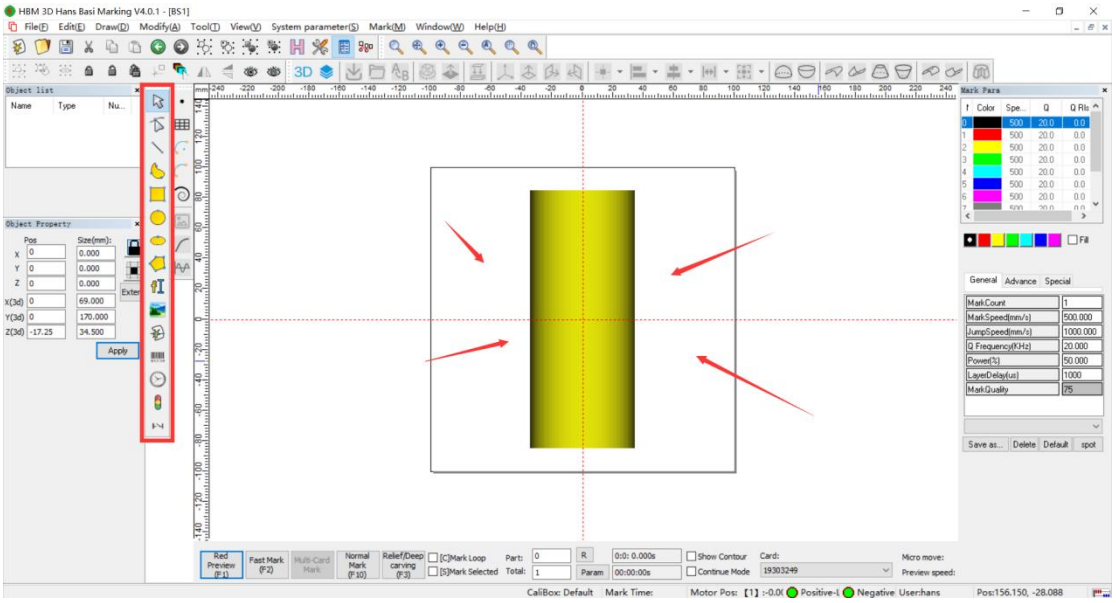
Click  will open the 3D model import function; the supported file formats are circled.



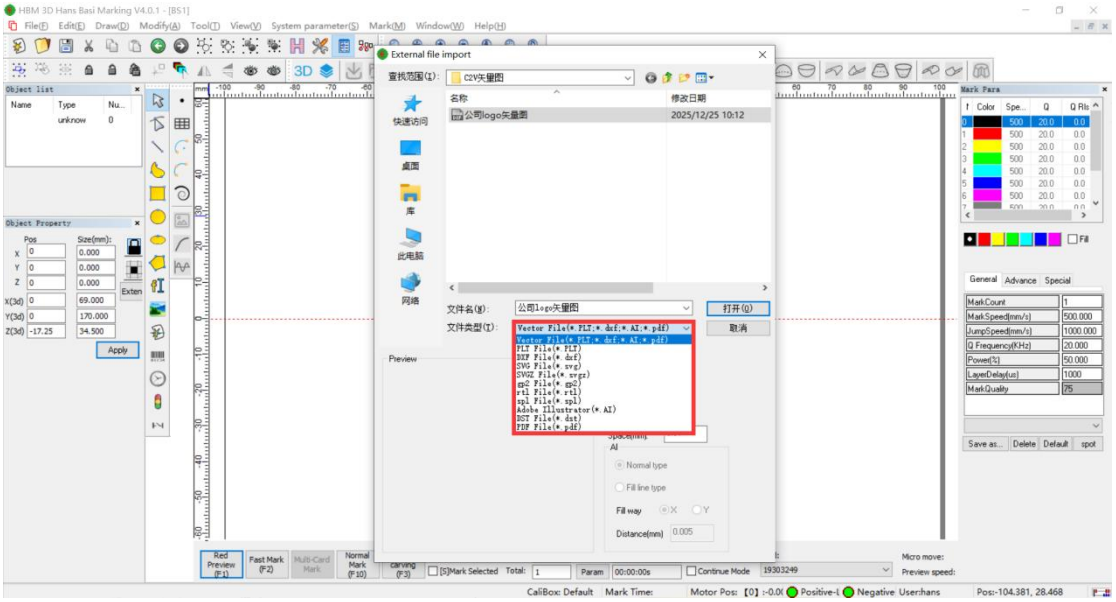
After introducing the import function, let's return to the section on building our own model. After filling in the model parameters, click OK.



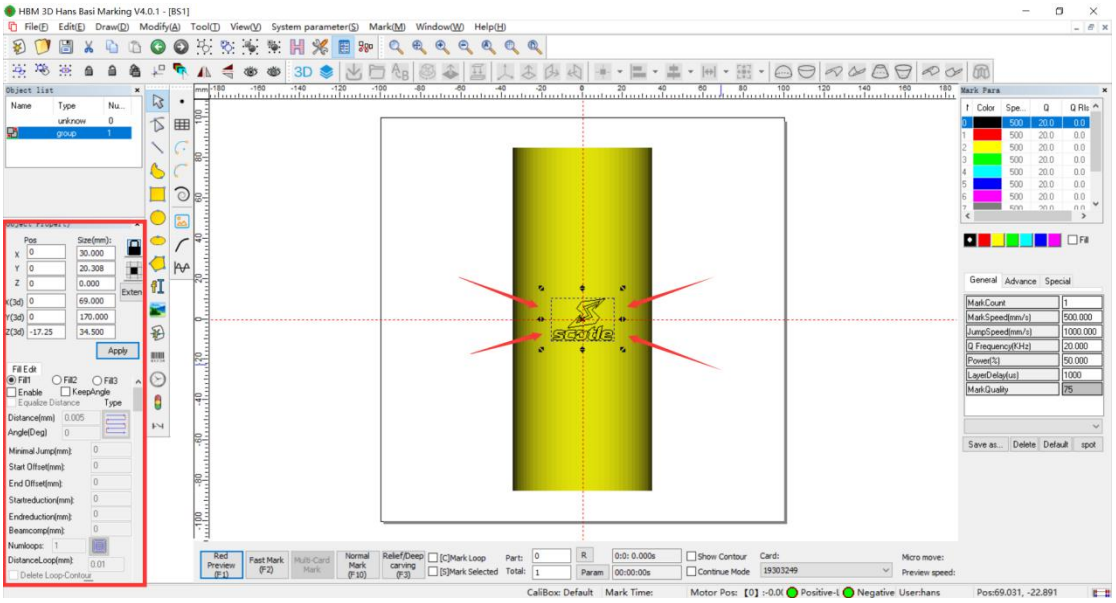
The 3D model created based on our parameters will then appear. Next, click  to exit the 3D interface and return to our 2D editing interface to add the necessary markings.



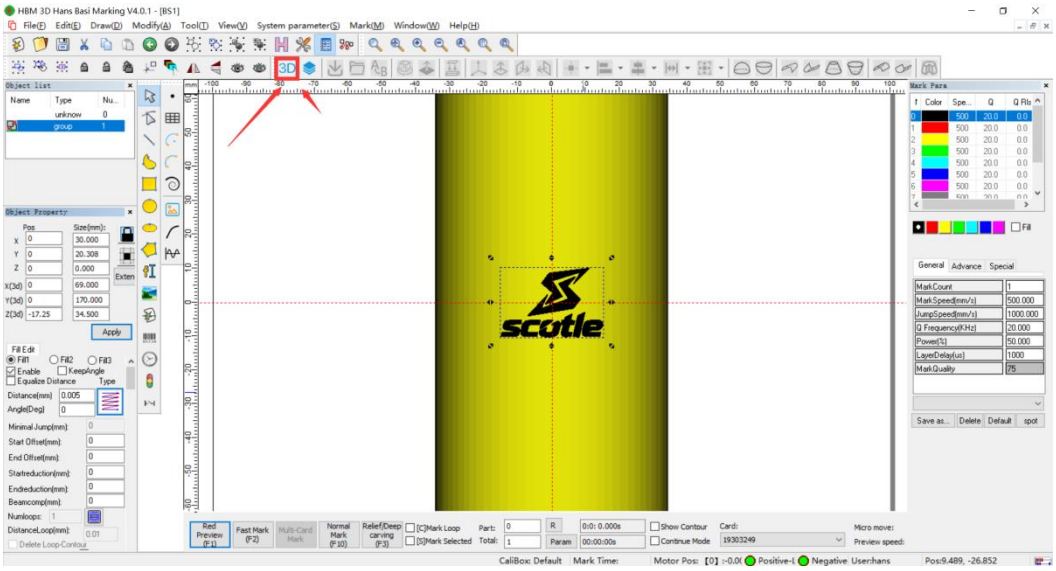
This step will show that our 3D model has been transformed into a 2D plane. The left-hand column allows you to import bitmap or vector graphics, or add text, QR codes, or other annotation content to this model.



Our test involved importing a vector graphic, specifically a DXF format (bitmap formats are not currently supported). Let's see the results after importing.

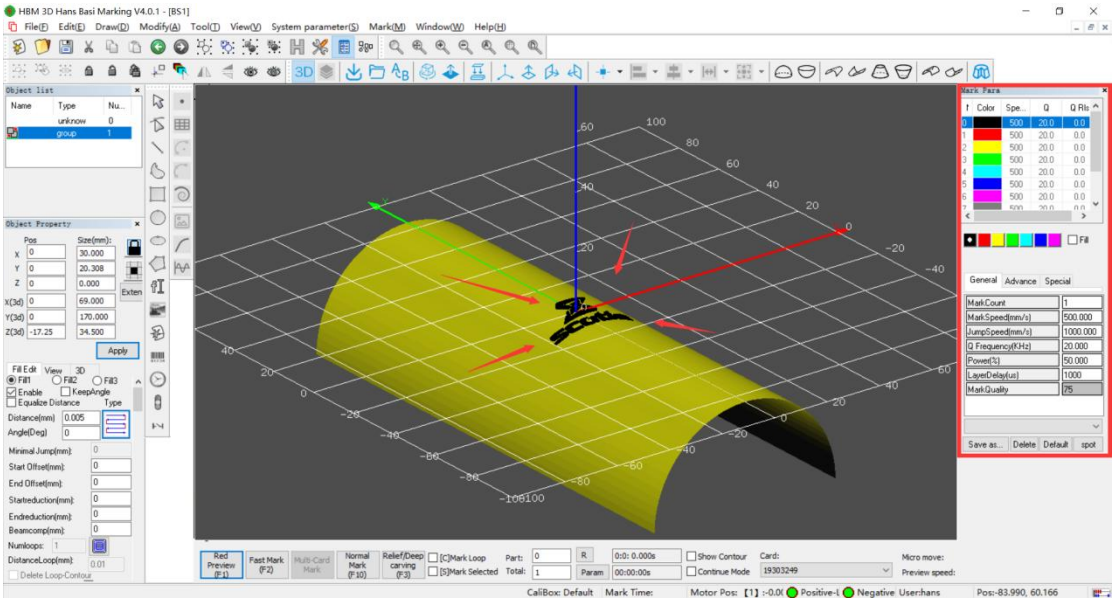


This is the vector graphic we imported. On the left, you can adjust the size and set parameters such as fill.

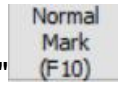


After making the adjustments, click 

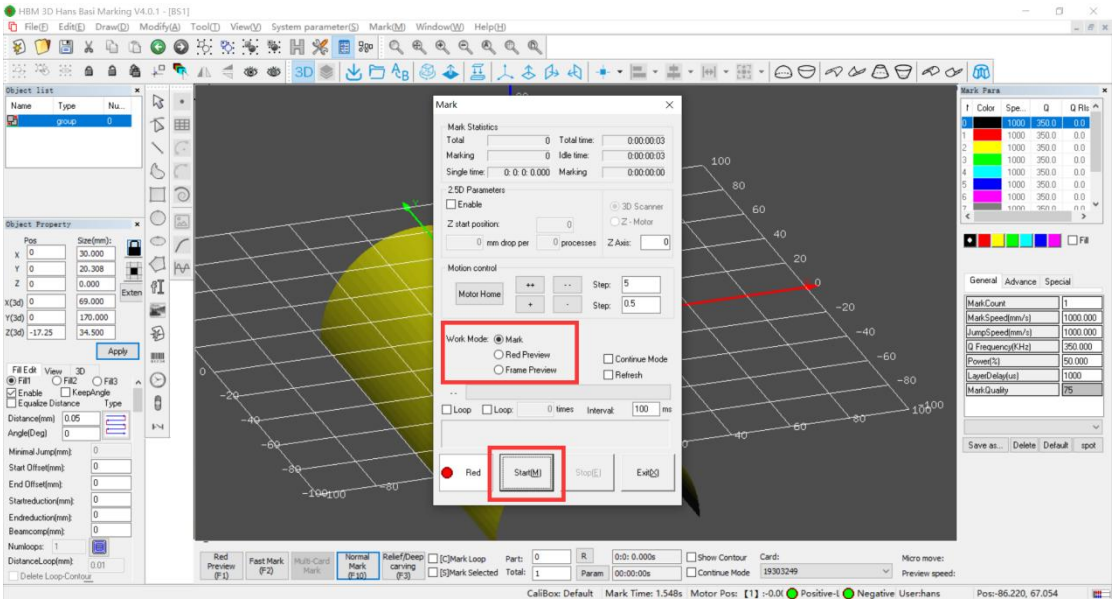
to return to our 3D view interface.



You'll find that the vector image we just imported is automatically pasted onto our self-created model (cylinder). Our XOY plane corresponds to the laser's focal point. After fixing the workpiece with the mold, place the focal point at the highest point of the workpiece. Once you've confirmed the focal point parameters, you can proceed to the next step.

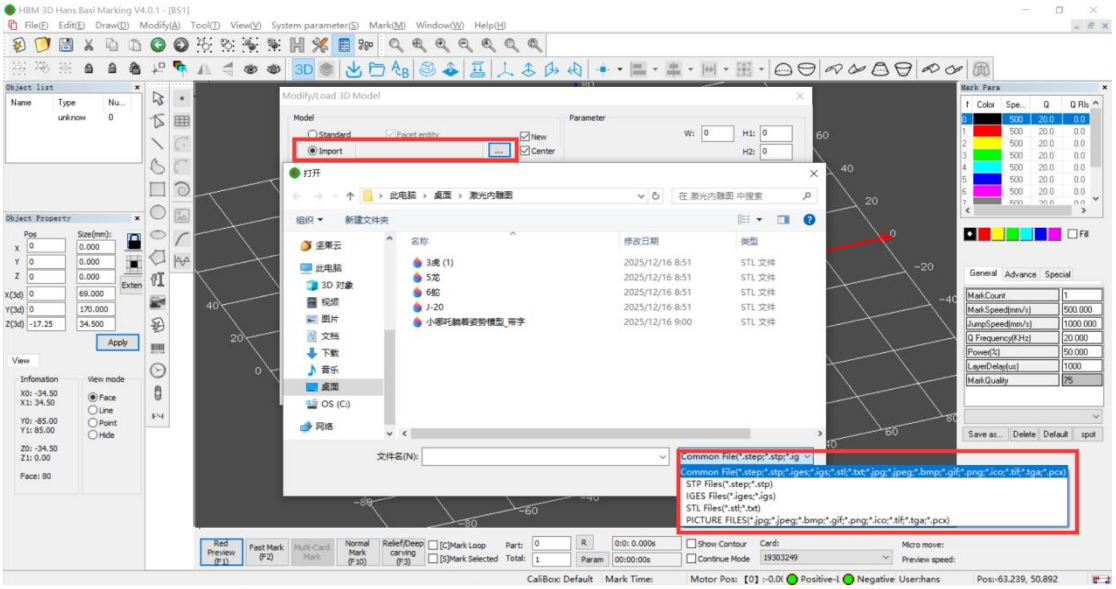
Once everything is ready, our 3D marking process ultimately involves clicking on "Normal Mark" 

to preview the light output or red light.

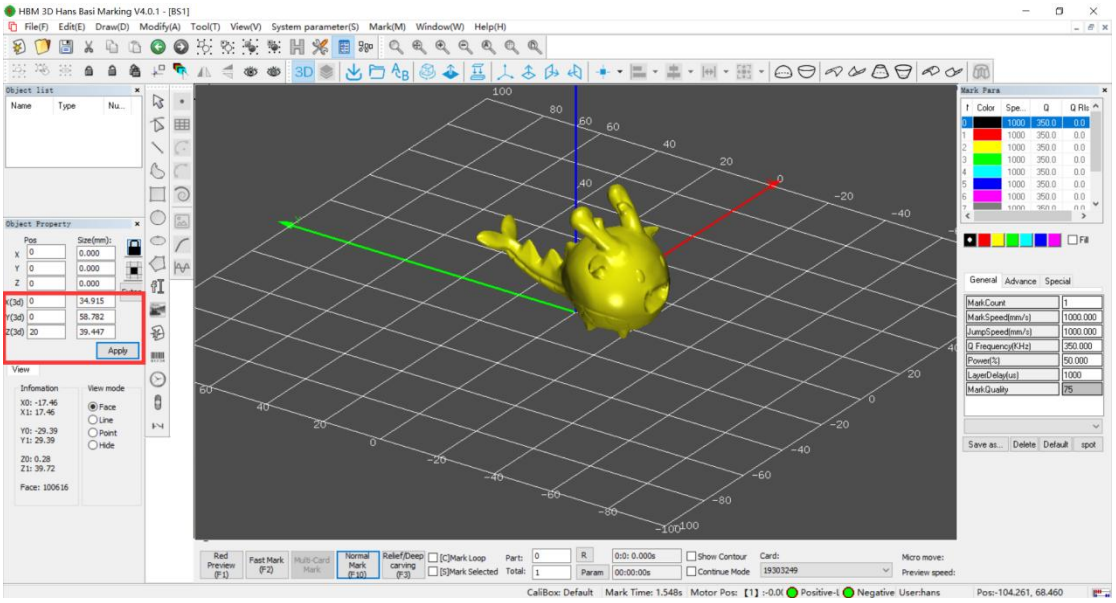


After selecting the working mode and using red light preview to confirm the marking position and focus on the workpiece plane, you can select Mark mode to begin 3D marking.

11.2 Importing models for 3D marking

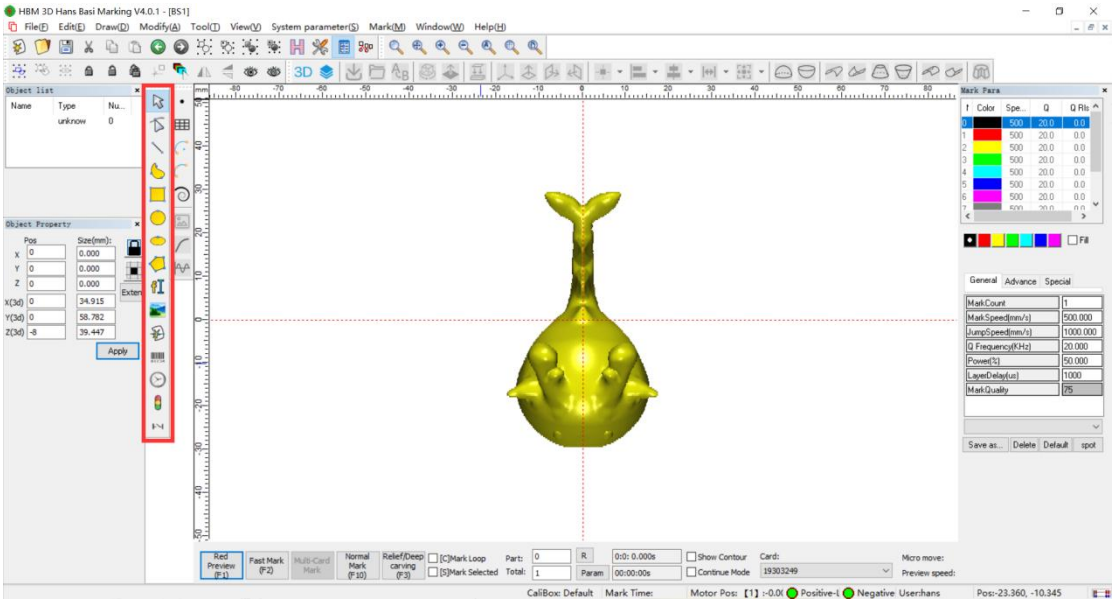


Similarly, in our 3D view interface, clicking  to enter the interface and selecting Import allows you to import 3D models. Below is a list of image types that can be imported.

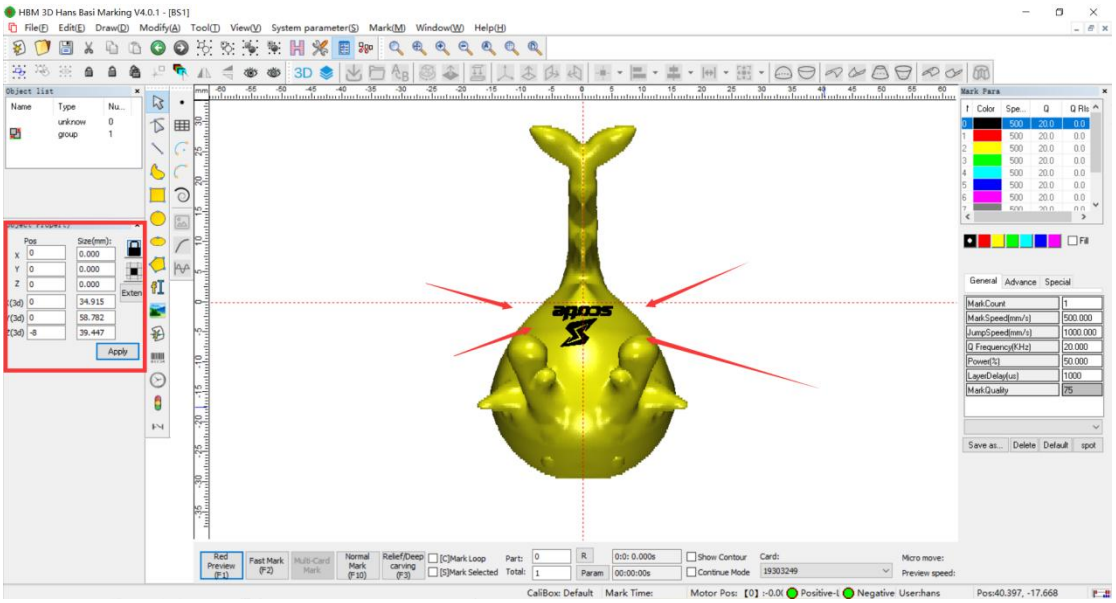


After importing and adjusting the size and position of the 3D model, it is recommended to place the plane to be marked on the X0Y plane. As mentioned before, this plane is the plane of the laser focus after focusing. Irregular shapes can be placed on the X0Y plane of the focus, as shown in the image.

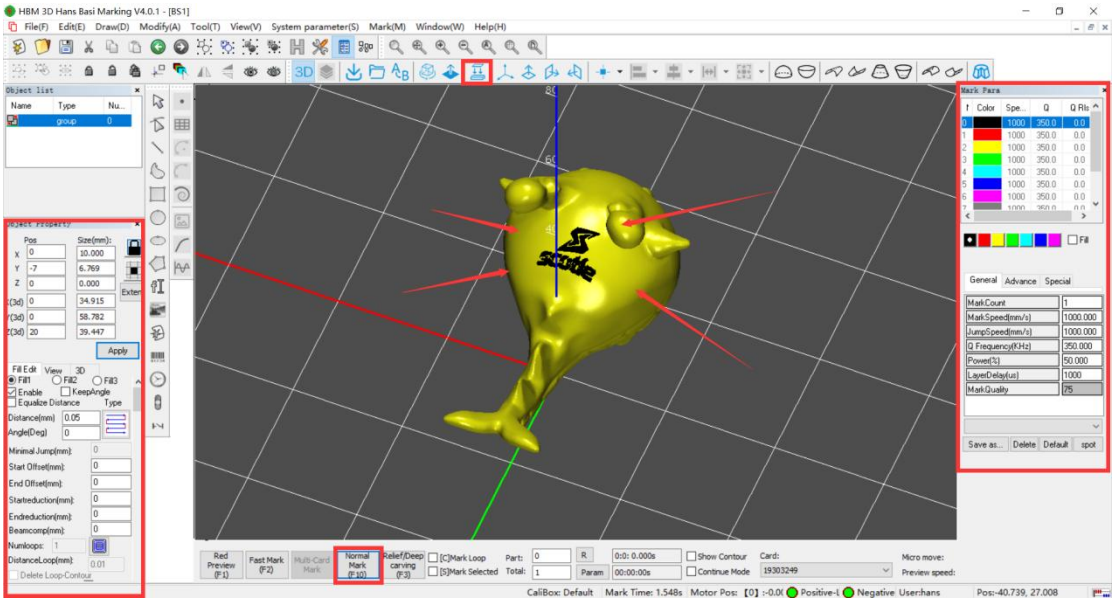
Then, follow the same steps to click  to exit the 3D view and return to the plane to edit the content to be marked.



As you can see, our 3D model has also been converted into 2D mode. Add the content to be labeled on the left.

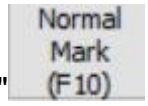


After adjusting the parameters of the marking content, you also need to click  to return to the 3D interface.

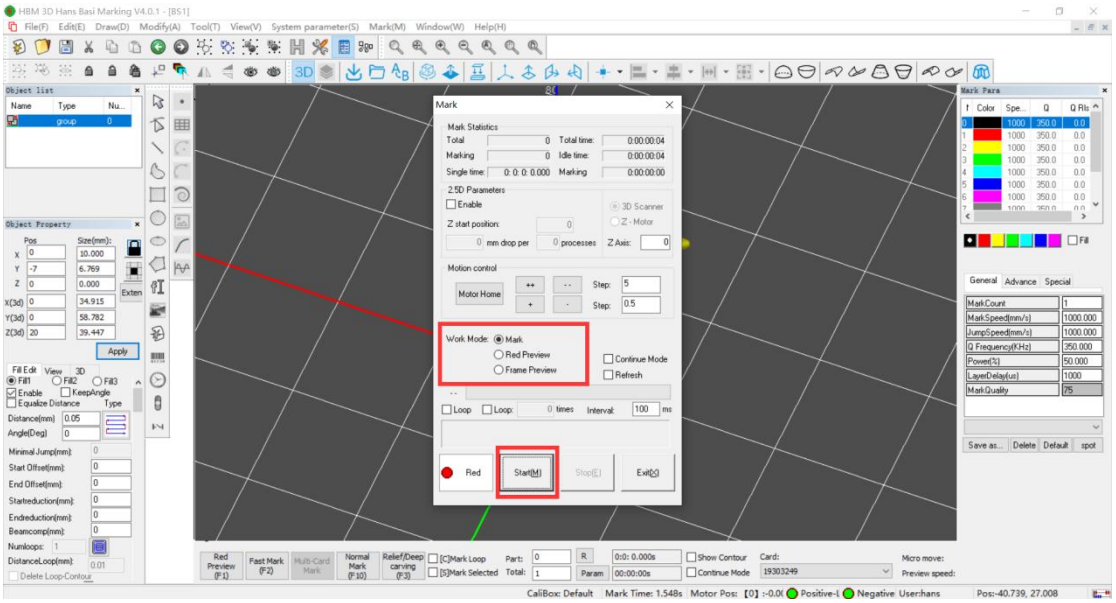



If the model doesn't align with the marking content after switching to 3D view, click the "Auto Attach" button.

On the left, adjust the position of the 3D marking content as needed; on the right, adjust the laser marking parameters.

After adjusting, click the " 

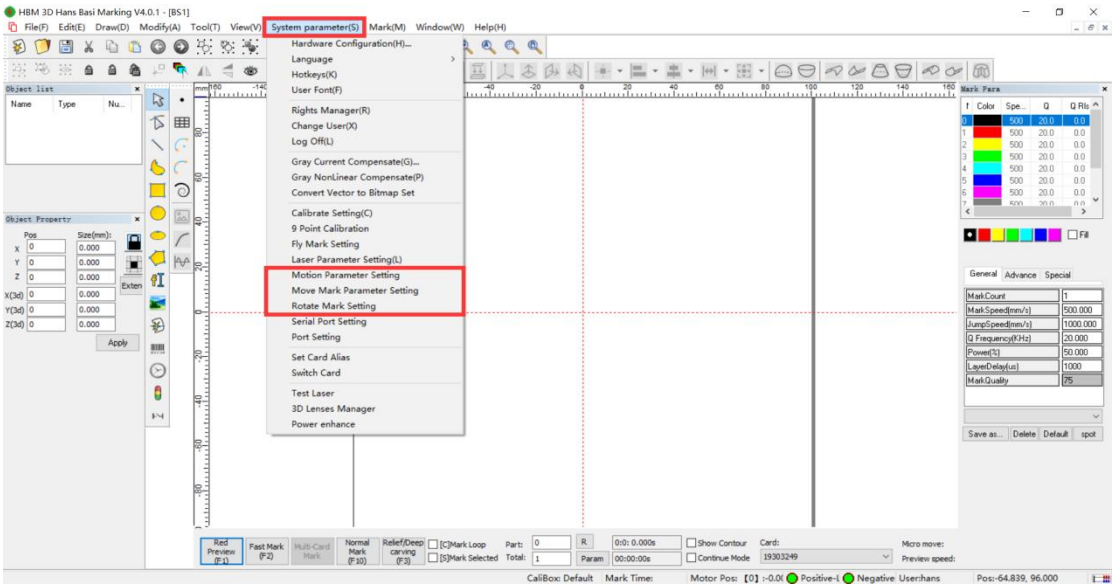
Normal Mark" interface to begin marking.



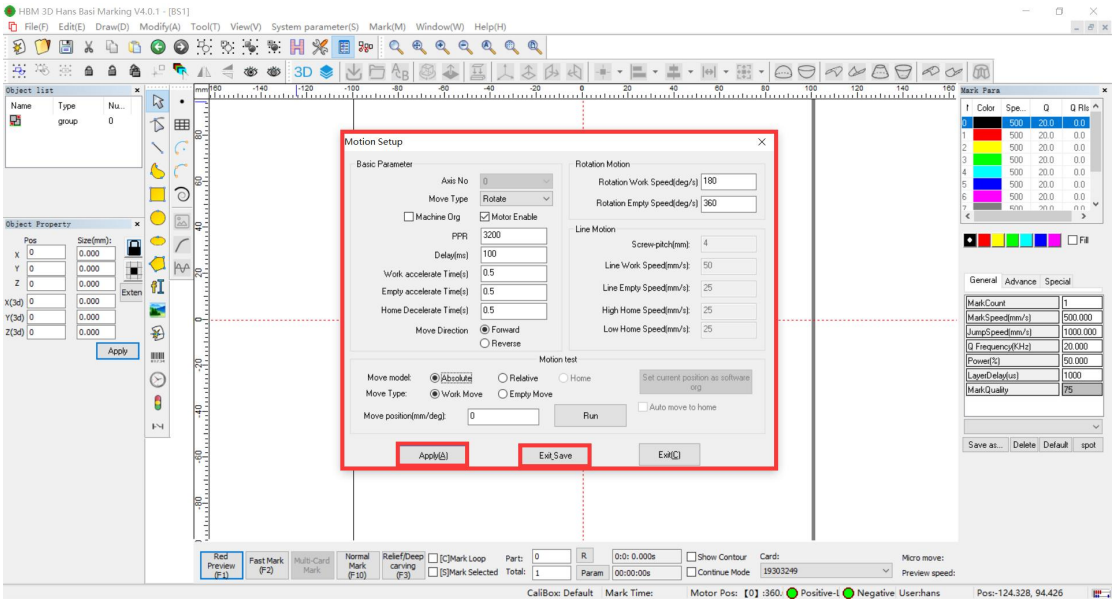
After selecting the working mode and confirming the position using red light preview, you can begin 3D marking.

12. Rotary axis marking （if you bought a rotary axis）

First, this is the orientation of the rotating axis.



The three sections highlighted in the image are motion parameter settings, dynamic motion marking settings, and rotational marking settings. These three parameters are set and adjusted according to the commonly used D80. Once set, they generally don't need to be changed. However, if the workpiece size changes, some settings will need to be modified, which I will highlight below.

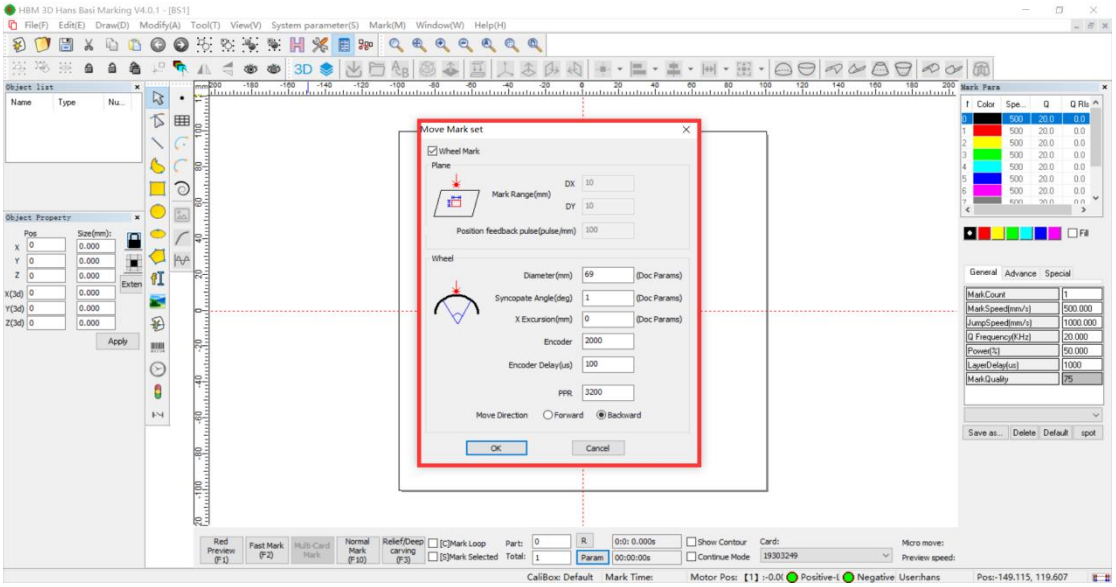


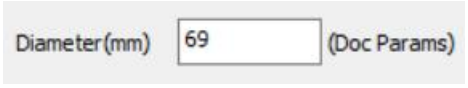
The axis parameters must be set according to the parameters shown in the diagram. After setting them, you must first click 

and then click 

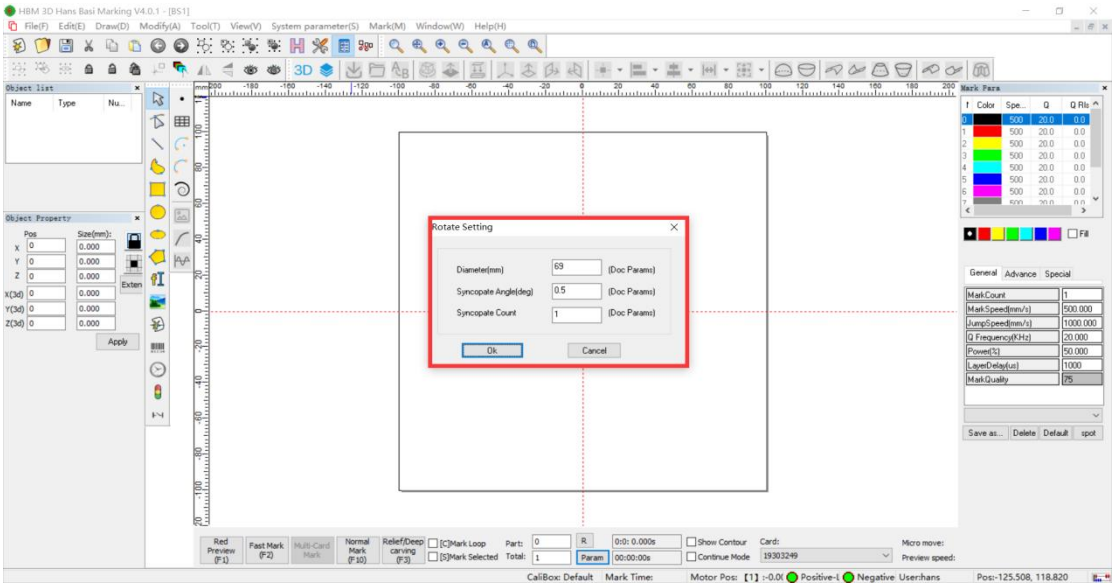
again to save the parameters

before you can use the rotary axis for marking.

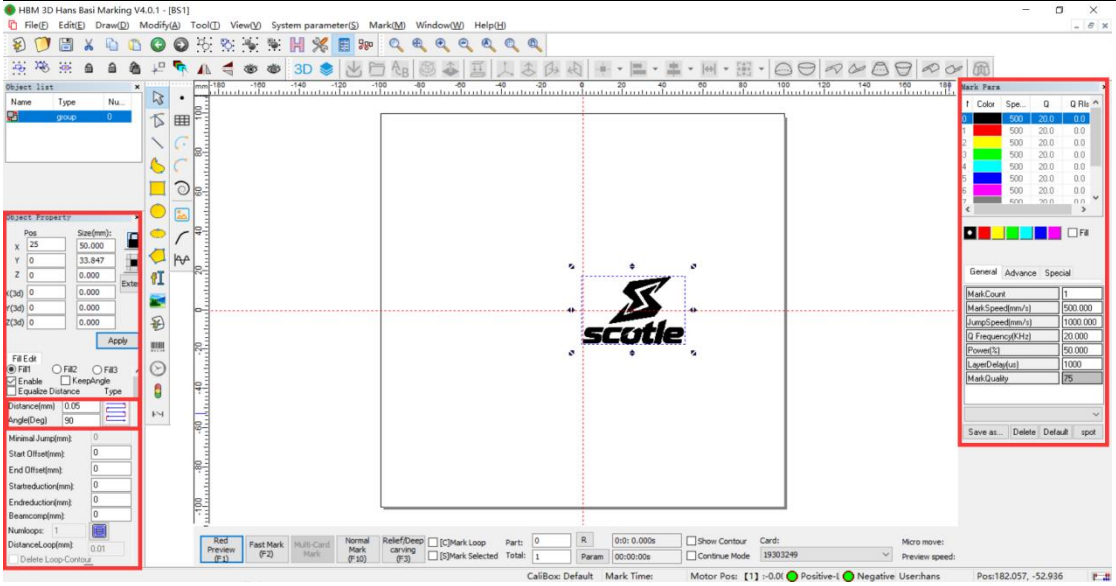




If the workpiece is replaced, the diameter of the marking surface on that workpiece needs to be modified; other parts do not require modification unless necessary.



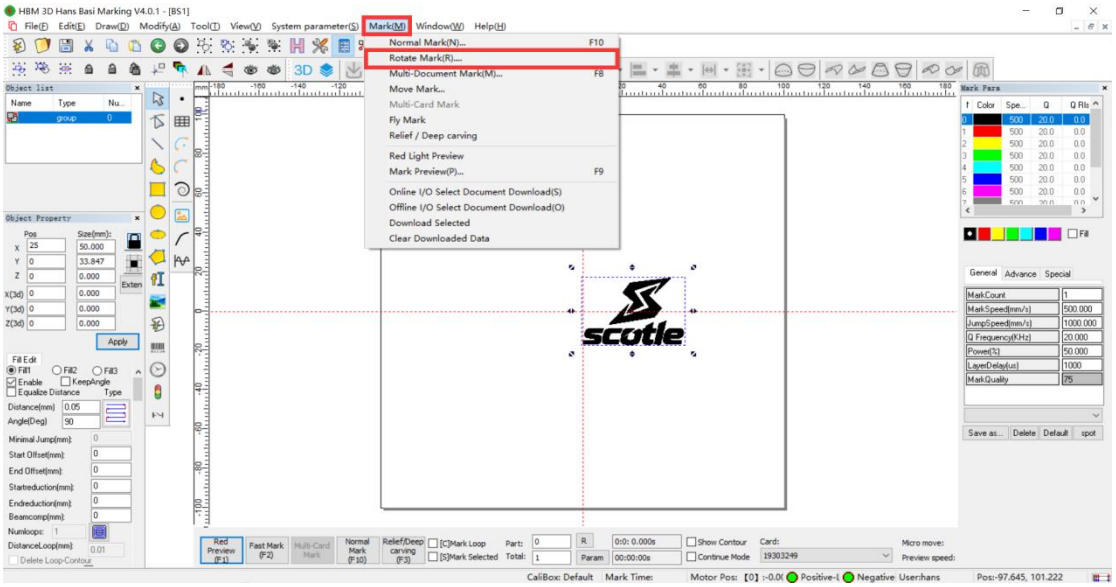
If the workpiece is replaced, the diameter of the marking surface on that workpiece needs to be modified; other parts do not require modification unless necessary.



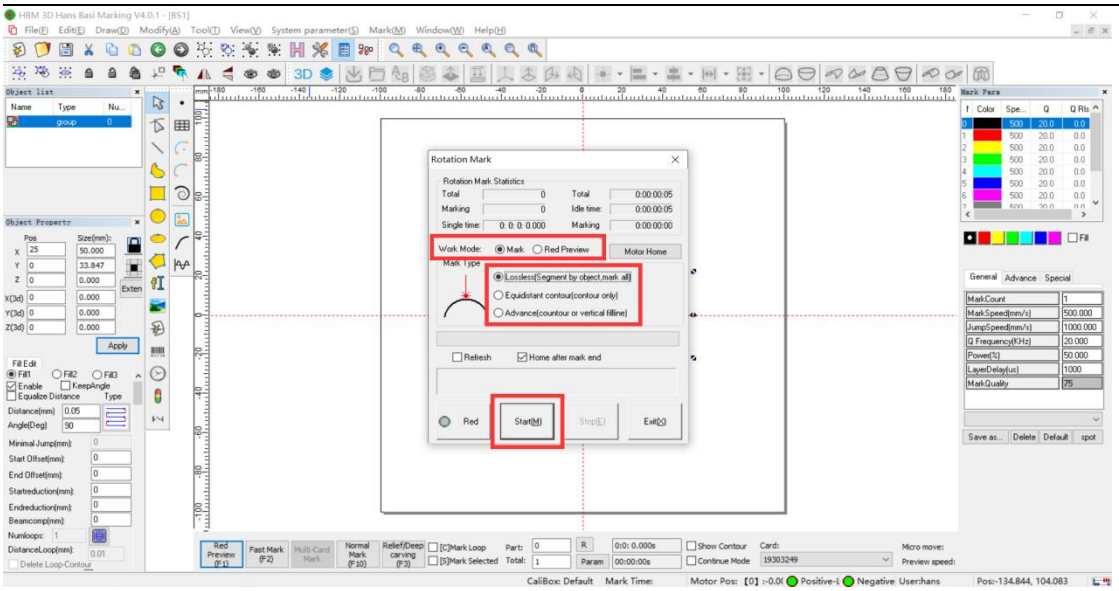
The fill angle and method selected for the left border are very important. If you're marking from left to right, you can fill as shown in the image with a 90-degree (recommend) fill angle. If you need to mark a character and then rotate, use a -90-degree angle. The different modes will be explained below.

The pattern to be marked can be placed to the right of the red line, as shown here, for easy rotation during marking.

The right side is for setting the laser parameters. Before marking, confirm the parameters and focus position.

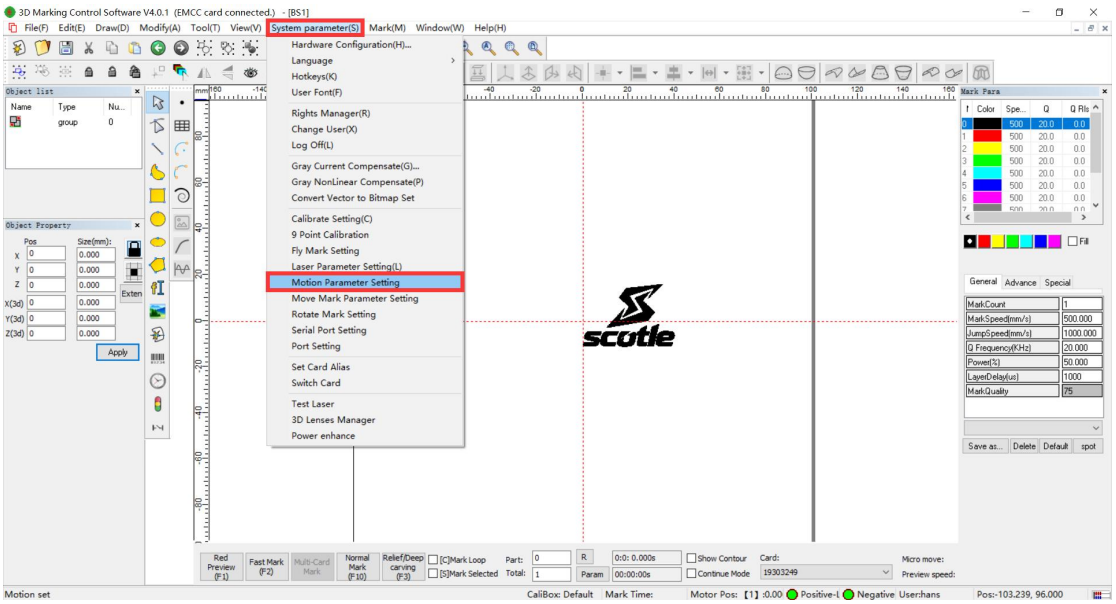


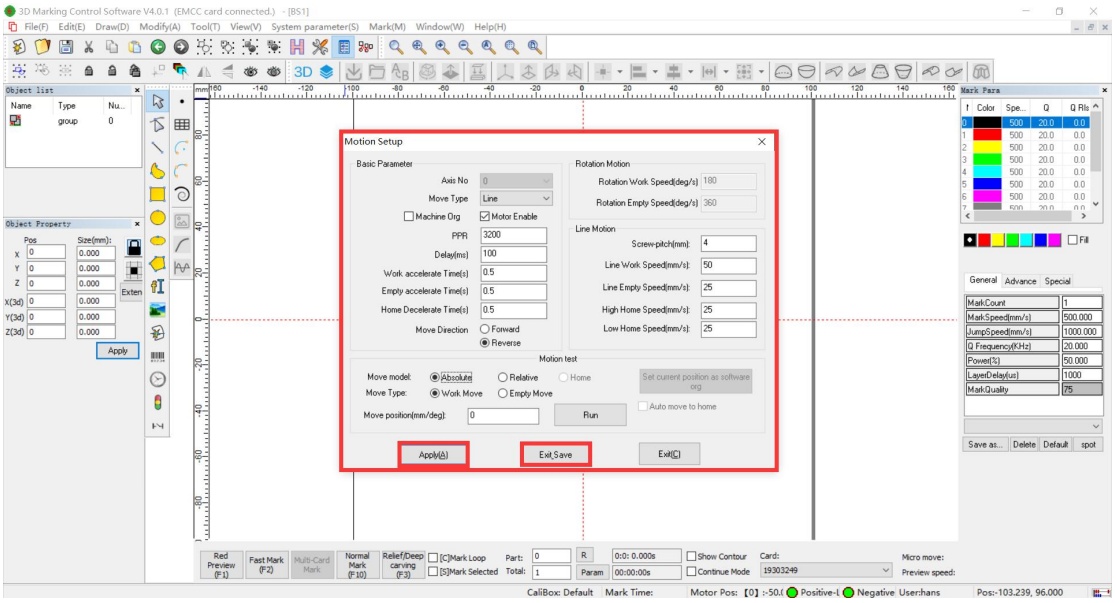
Finish setting and click 



After entering this interface, we have three marking modes to choose from. The first, non-destructive mode, is what I mentioned above: after marking one character,
rotate it by filling in a -90-degree fill angle. However, this mode is better for marking rotating text. If it's vector graphic marking, we choose the third mode, the equal-angle comprehensive rotation marking mode. In this mode, the fill angle is 90 degrees, and the marking is based on the fill line. After selecting, you can preview the marking position with red light. Once you're sure it's correct, you can start rotating the marking.

How to switch back to the Z-axis?





Once you enter this interface, you can modify all the parameters shown in the image. After setting them, you must click 

and then click 

again to save the parameters before you can run the Z-axis.

13. Laser source parameter

(The specific laser parameters are determined by the model you purchased.)

Product Model		YDFLP-E2-60-M7-M-R	YDFLP-E2-200-M7-M-R	YDFLP-E2-100-M7-M-R
M^2		< 1.5	< 1.6	< 1.6
Armored Cable Length	m	3	5	3
Nominal Average Output Power	W	> 60	> 200	> 100
Maximum Pulse Energy	mJ	2	1.5	1.5
Pulse Repetition Rate Range	kHz	1 ~ 4000	1 ~ 4000	1 ~ 4000
Pulse Duration	ns	2 ~ 500	2 ~ 500	2 ~ 500
Galvo Scanner		SINO-GALVO SG7110	SINO-GALVO SG7110	SINO-GALVO SG7110
Marking Speed		5000mm/s	5000mm/s	5000mm/s
Positioning speed		8000mm/s	8000mm/s	8000mm/s

Output Power Stability	%	< 5	< 5	< 5
Cooling Method		Air Cooled	Air Cooled	Air Cooled
Supply DC Voltage (VDC)	V	24	48	24
Power Consumption	W	〈 330	< 830	< 440
Environmental Supply Current	A	〉 13	> 14.6	> 18
Central Emission Wavelength	nm	1064	1064	1064
Emission Bandwidth@3dB	nm	〈 15	< 15	< 15
Polarization Orientation		Random	Random	Random
Anti-high Reflection		Yes	Yes	Yes
Output Beam Diameter	mm	7±0.5	7.±1.0	7±0.5
Output Power Tuning Range	%	0 ~ 100	0 ~ 100	0 ~ 100
Operation Temperature	℃	0 ~ 40	0 ~ 40	0 ~ 40
Storage Temperature	℃	-10 ~ 60	-10 ~ 60	-10 ~ 60
N.W	kg	4.1	10.5	8.5
Size(L×W×H)	mm	205 × 253.3 × 75	340 × 265 × 100	336 × 255 × 90

14. precautionary note

This device has an output wavelength of 1064nm (invisible light) and an average output power of over 200W. It is classified as a Class IV laser, which not only poses great harm to the eyes but also burns the skin. Its reflected and scattered light may also cause harm to the human body. Therefore, please wear OD4+grade laser protective goggles throughout use.

The irradiance that may incident on the surface of the goggles is 0.01W/m2. Do not directly observe the laser output head. It is recommended to wear laser protective goggles throughout the operation!

We prepare this protective goggles for the device, Optical density test results:

wavelength（nm)	optical density
1064	>6

When you don't need this device to work, be sure to keep the laser switch off and inform children to stay away from the device, avoid accidental contact with the danger laser.

15. Q&A

Q: What should I do if the U-Disk is not found in the package?
A: This is because the customs took out the U disk during customs clearance.
Please contact customer service in time and leave your email. We will send you the U-Disk Files.

Q: If the computer prompts that file has a virus when I install the software, what should I do?
A: You must close all anti-virus software on your computer before installing the software.

Q: When I install the software, it shows “The correct file format is error!” What should I do?
A: Because you need to load the calibration file, check machine manual.

Q: Can this 3D machine make relief engraving? deep engraving?
A: Yes, this machine can do relief effet well, if you want deep engraving, according to your power, marking times.