



G3pro-Vision User Manual

V1.0

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CATALOG

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Foreword

Statement

Welcome to JCZ , please read this manual carefully before use. If you have any questions, please feel free to call our service staff and we will be happy to help you.

Beijing JCZ Technology Co., Ltd. may update the contents of the manual at any time due to software or hardware upgrades. All updates will be included in the new version of the manual without prior notice.

About copyright

JCZ reserves the right to modify the products and product specifications in this manual without prior notice.

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General agreement: "BJJCZ", "JCZ Technology", is the trademark of the company. No organization or individual may use the same or similar trademarks on the goods without the permission of the company.



Version

Date	Version	Update

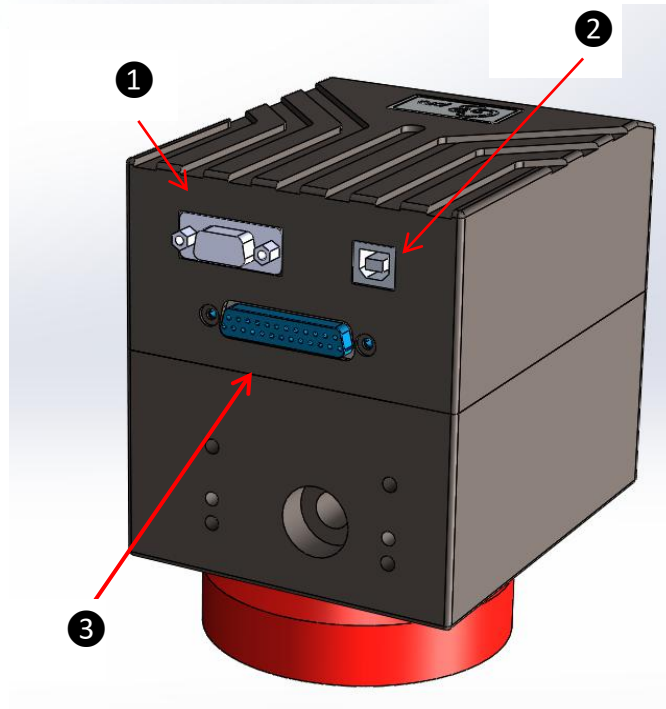
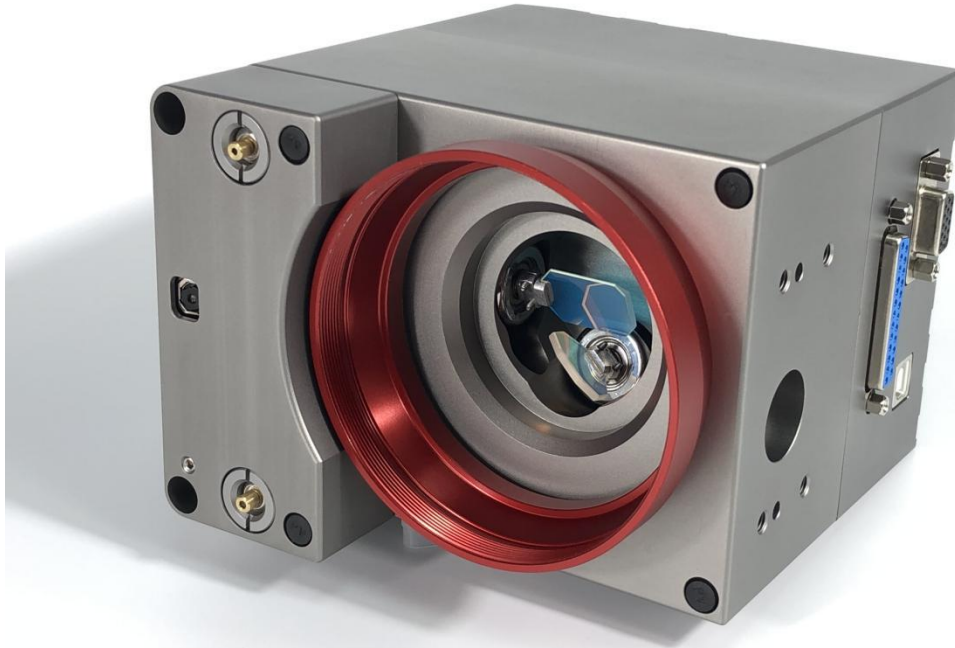


Chapter One : G3pro-Vision Parameter

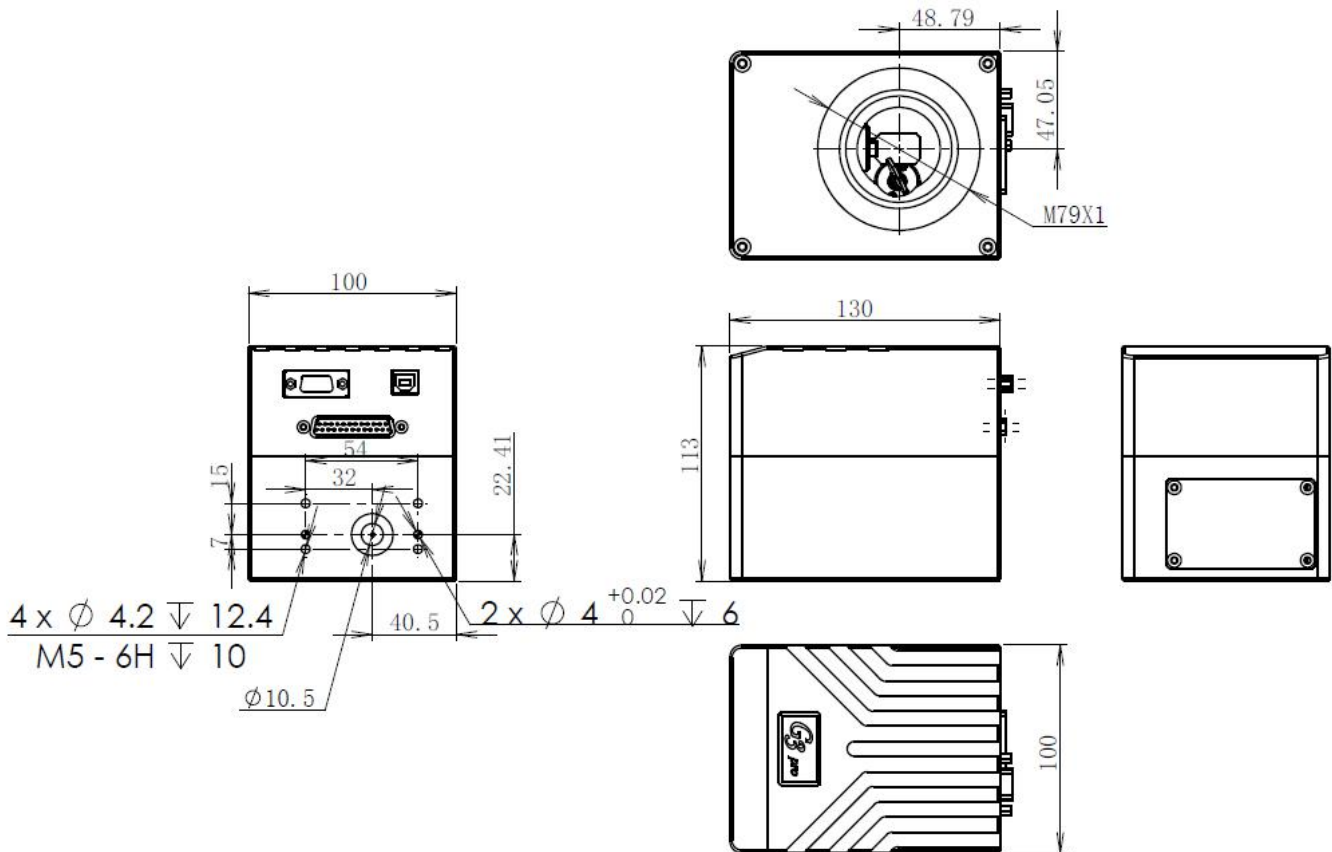
Galvo	Marking Speed	5000mm/s
	Positioning Speed	10000mm/s
	Tracking Error	0.25ms
	Non-linearity	3.5mrad
	1% of Full Scale	≤0.3ms
	Max Gain Drift	< 50PPM/k
	Max Offset Drift	< 15μRad/k
	Long-term Drift Over 8h	< 30mrad
	Max Scan Angle	±0.35rad
	Input Beam Aperture	10mm
	Protocol	XY2-100
	Wavelength	10600nm、1064nm、532nm、355nm
Power	Power Requirements	±15VDC , 3A
	Peak current	15A
Basic	Storage Temperature	-10 to +60°C
	Ambient Temperature	25°C±10°C
	Weight	2100g
Camera	Pixel	500MP
	Focus length	30mm - 1000mm (The longer the focal length is, the more blurred the image quality)
	Camera calibration	Calibrate it depend on the f-theta lens

Chapter Two :Dimension and Pins

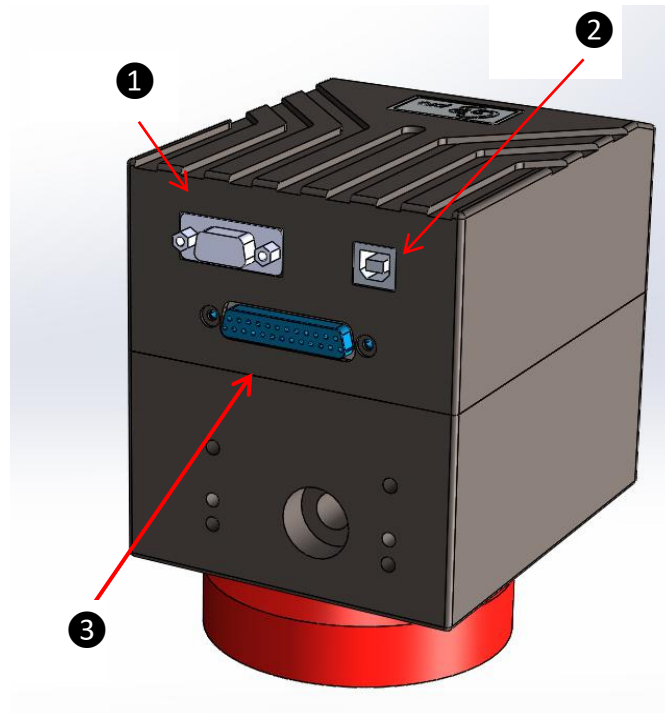
1. Appearance



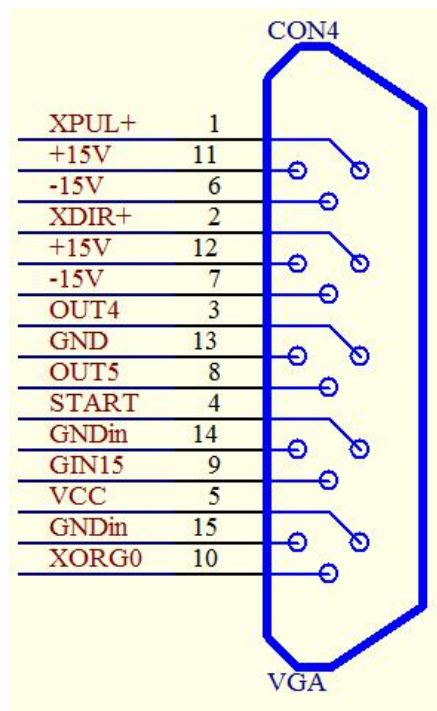
2. Housing Dimension Drawing



3. Pins Detail



(1) DB15 : Power / IO / Axis (①)

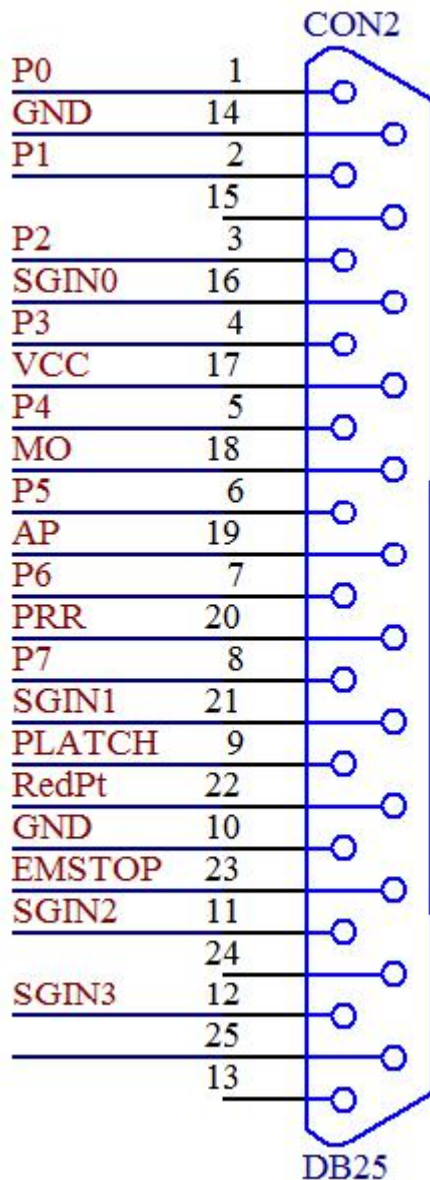




Pins No.	Name	Description
11,12	+15V	+15V. The positive terminal of the power supply.
6, 7	-15V	-15V. The Negative terminal of the power supply.
14,15	GNDIN	Ground . The Com terminal of the power supply.
13	GND	GND of XDIR+,XPUL+ signal .
3,8	OUT4,OUT5	Output. TTL . Forming a loop with the GND (Pin13) .
2	XDIR+	Axis direction signal. TTL ,For common anode, use VCC and XDIR+ signals, and VCC is anode signal.
1	XPUL+	Axis pulse signal. TTL. For common anode, use VCC and XDIR+ signals, and VCC is anode signal.
10	XORG0	The home signal of extension axis X. To use this pin just connect it and GNDIN to a switch. In software In14 represents this pin.
9	GIN15	Input signal. Forming a loop with the GNDIN (Pin 14/15) .
4	START	Remark input signal.Forming a loop with the GNDIN (Pin 14/15) .When it is activated the control will mark the content in the cache.
5	VCC	5V power output.

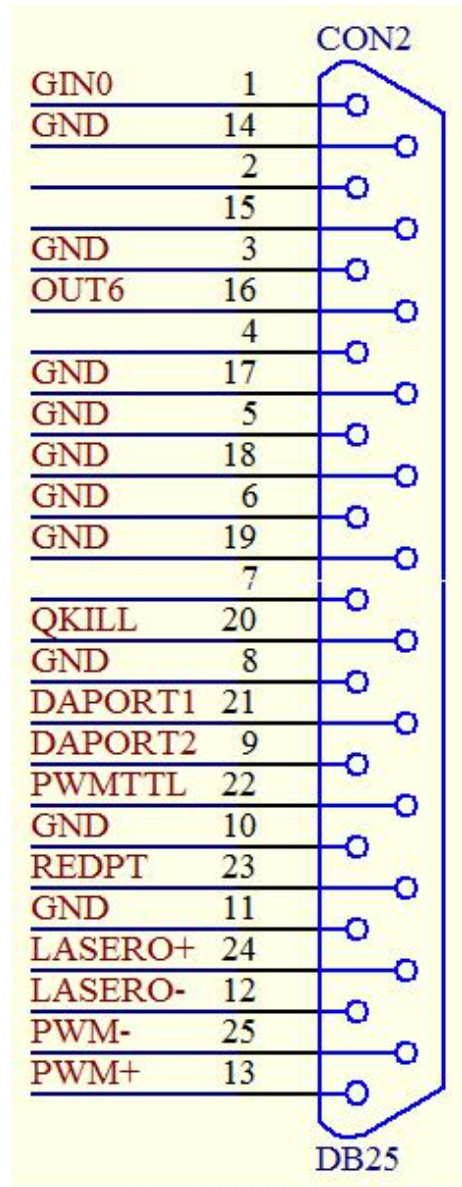
(2) USB : USB signal (2)

USB2.0

(3) DB25 : Laser control (③)**① Fiber Model:**

Pins No.	Name	Description
1—8	P0—P7	Laser power signal.TTL .
9	PLATCH	Power signal latch. TTL .
10,14	GND	The reference ground of the control board.
16,21,11,1,2	LASERST0~3	Alarm signal of Laser module
17	VCC	5V power output.
18	MO	Main oscillator signal. TTL .
19	AP	Power amplifier signal. TTL .
20	PRR	Pulse repetitive rate signal. TTL .
22	RedPt	Red light pointer signal. TTL .
23	EMSTOP	Emergency stop signal. TTL .
13,24,25		Unconnected

② YAG Model :

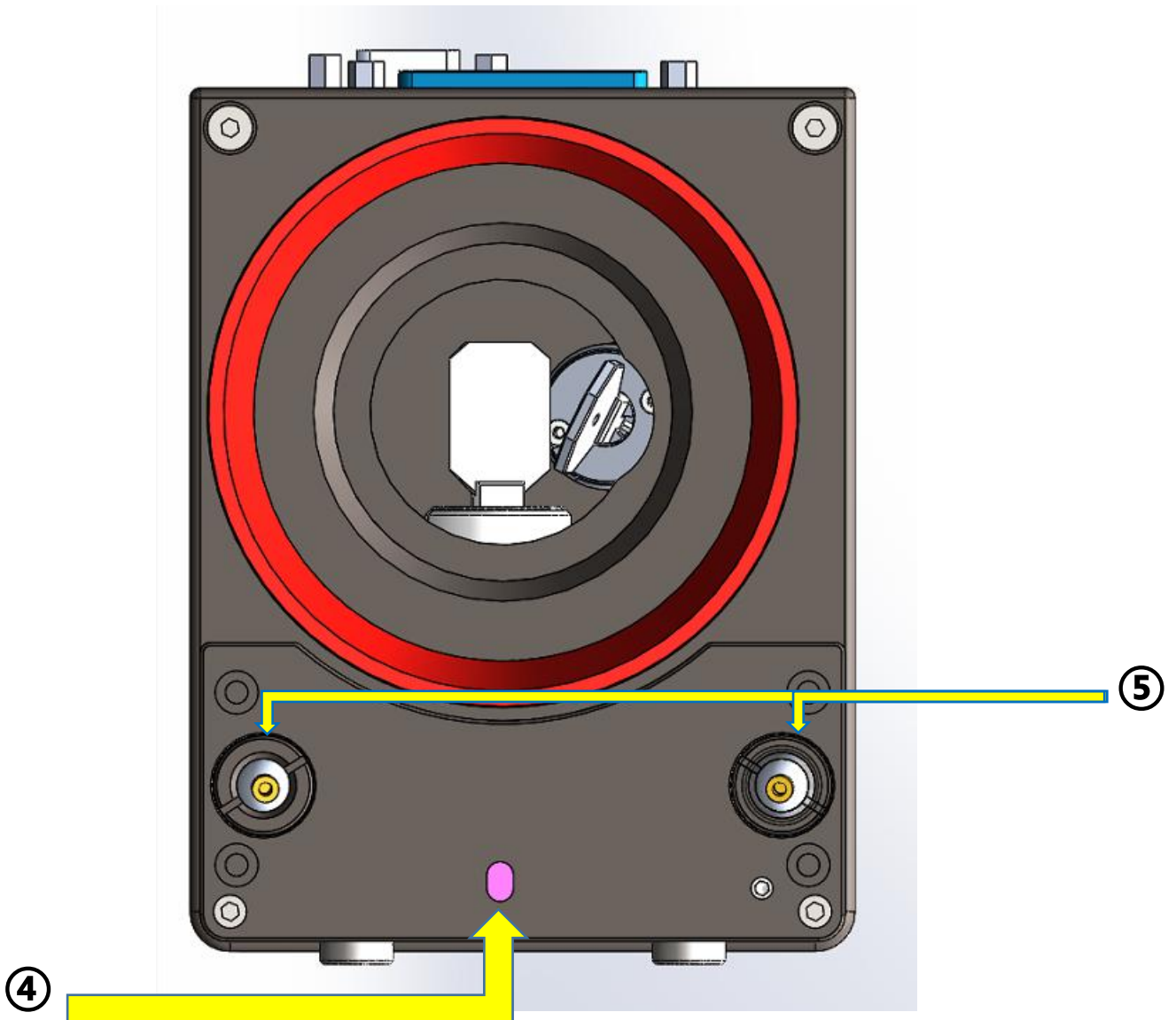




Pins No.	Name	Description
3,5,6,8,10,11, 14,17,18,19	GND	Control board' s GND signal, also is the 5V input power' s GND signal. For all the GND with other signal.
20	QKILL	First pulse kill signal. TTL compatible. Work with GND.
9	DAPORT2	Frequency control/ first pulse kill. This is a analog signal between 0-5V. the maxim drive current is 5mA. To switch between these 2 signals use the settings in software.
21	DAPORT1	Laser power signal. This is a analog signal between 0-10V. The maxim drive current is 5mA.
23	RedPt / OUT8	Red light pointer signal. TTL compatible. Or Out 8 signal
12	LaserO-	Laser on signal. TTL compatible. Low level effective.
24	LaserO+	Laser on signal. TTL compatible. High level effective.
25,13	PWM-/PWM+	PWM signal. Differential output.
22	PWMTTL	PWM signal. TTL output. The ground reference signal is GND. For CO2 lasers, this signal is used to set the power of the laser and also as a tickle signal output; for YAG lasers, this signal is used as a repetitive frequency signal for the Q driver.
1	GIN0	GIN0 Input signal. Forming a loop with the GND.

Noted: G3pro scan head must work with Ezcad2-lite pro software.

4. Features

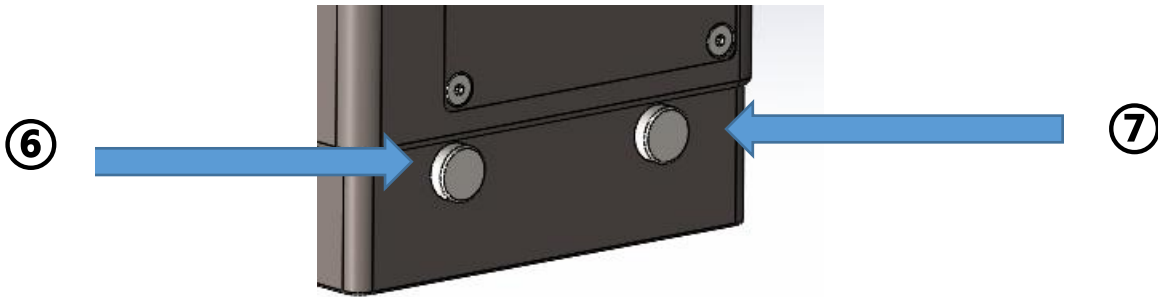


(4) Camera (4)

Camera for background display and positioning functions.

(5) Pilot Red light (5)

The Pilot red light, Press the Pilot button , the double red light will light up.

**(6) Pilot button (⑥)**

Press this button , the double red light will light up.

(7) Mark button (⑦)

Press this button, it will mark the content in the cache. (Before using this button, have to use the ezcad2-lite pro software to mark the files first . Once the files changed , use the ezcad2-lite pro software to mark the files first again.)

Noted: G3pro scan head must work with Ezcad2-lite pro software.



Chapter Three :Install and Using

1. Basic Install

- Open the package , Take out G3 Pro-v scan head and related accessories (Check the delivery list.)
- Tear off the dust-proof sticker of the optical path hole .
- Fix the G3 Pro-v scan head to the frame. (Maybe it need the adapter plate.)

2. Adjust the Light path

Adjust the accessories , make sure the Laser beam output center and the beam input hole center being coaxial. Fix the G3 Pro-v scan head.


3. Power

Power the scan head , Connect the USB on the PC .

4. Find the focus

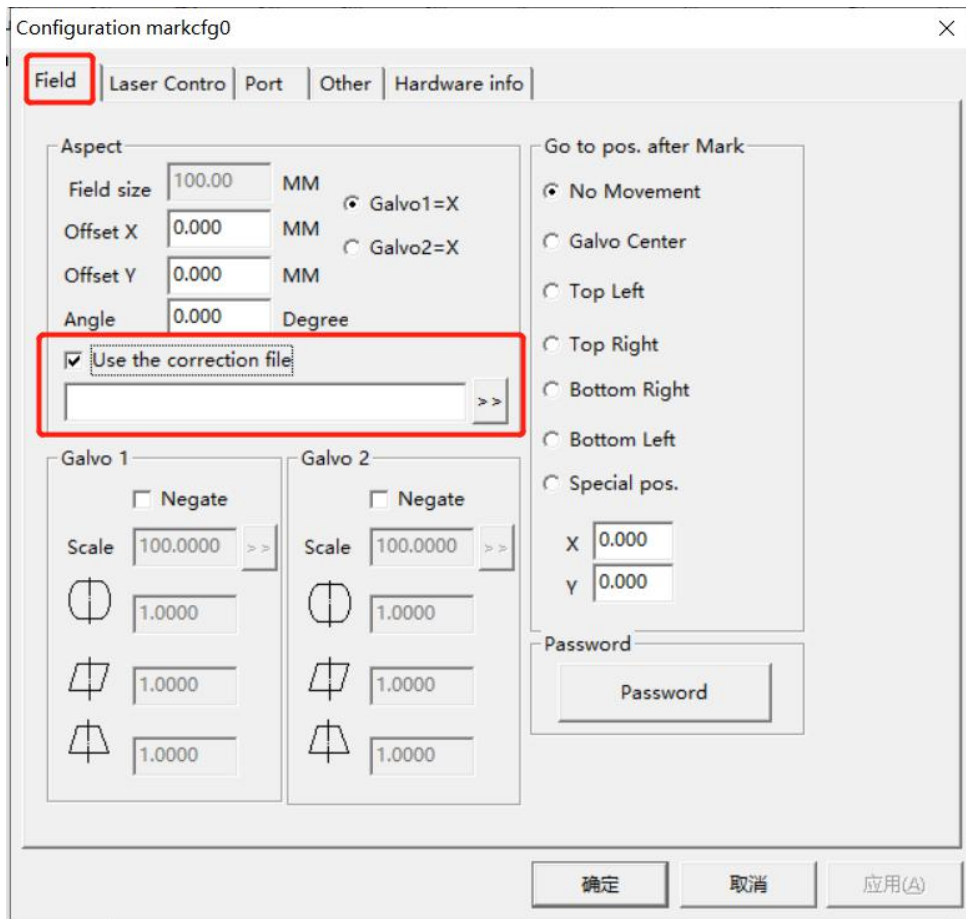
Open Ezcad2-lite pro software, Draw a 3mm circle, Choose continue marking, Click Mark or F2 , Adjust the z lift to find the focus.

5. Make the calibration files.

Open the ezcad2-Lite pro software folder, Open  CorFile2.exe , generate and save the *****.Cor** calibration file according to the calibration manual.

6. Loading the calibration files.

Open Ezcad2-lite pro software, Click F3, Choose "Field" in the pop-up dialog box, check use calibration file, and Loading the *****.Cor** calibration file.



7. Make the camera calibration files.

Please check the Camera calibration (Chapter Four) .

8. Loading the camera calibration files.

Please check the Camera calibration (Chapter Four) .

9. Adjust the pilot red light

Please check the Adjust Pilot red light (Chapter Five) .

10. Processing

Make the files and marking with the software manual.



Chapter Four :Camera calibration

1. Software introduction

Camera collect image and send it to Ezcad workspace,calibrate program match the camera and scan head coordinate,so with this system,where you put the text on in workspace,where it will be marked on the real part(inside of the calibration area).

User can view the part and also adjust the text marking position according to the position of the part,no need to use red point.

Use this system in Windows OS, after get the key file from seller, put cursor on ezcad.exe then right keyboard choose **'Run as Administrator(A)'** . Only the first time to operate it like this, from the second time, just double click to run it.

2. Install the software

(1) Copy the Camera calibrate software (Cameracali) into the PC.

- Before using this system , please contact JCZ for the license.



(2) Double click **BJJCZ_remoteupdate.exe** , will show follow.



(3) Click "Update online" , Input the license into the box , click "OK" .





(4) The software show "Update success" .

Notes: Computer need to link internet, also must fix computer and dongle!

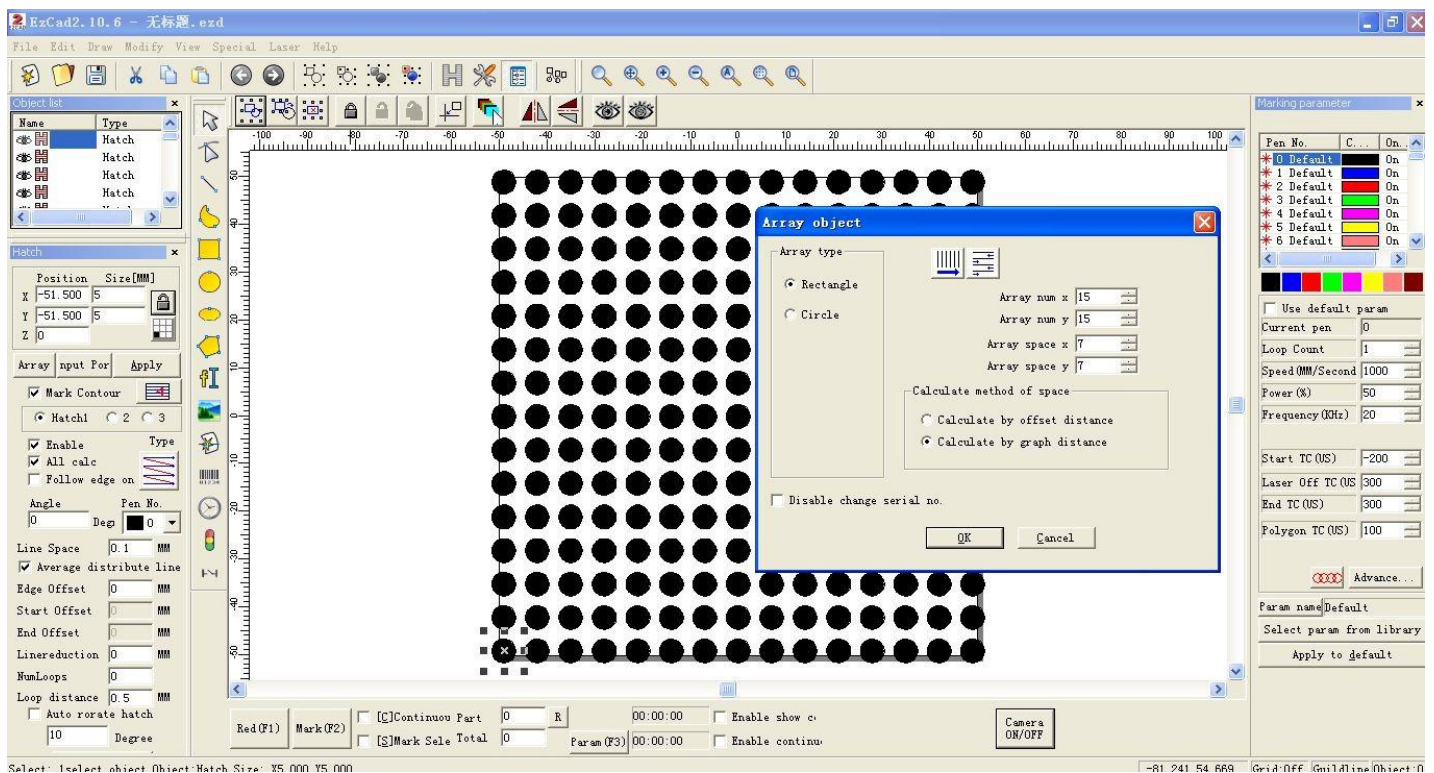
One license can used on one PC only.

3. Make the CameraCali file

(1) Open Ezcad2-lite pro software . Click F3 to finish parameter setting and also load in the scanhead calibration file.

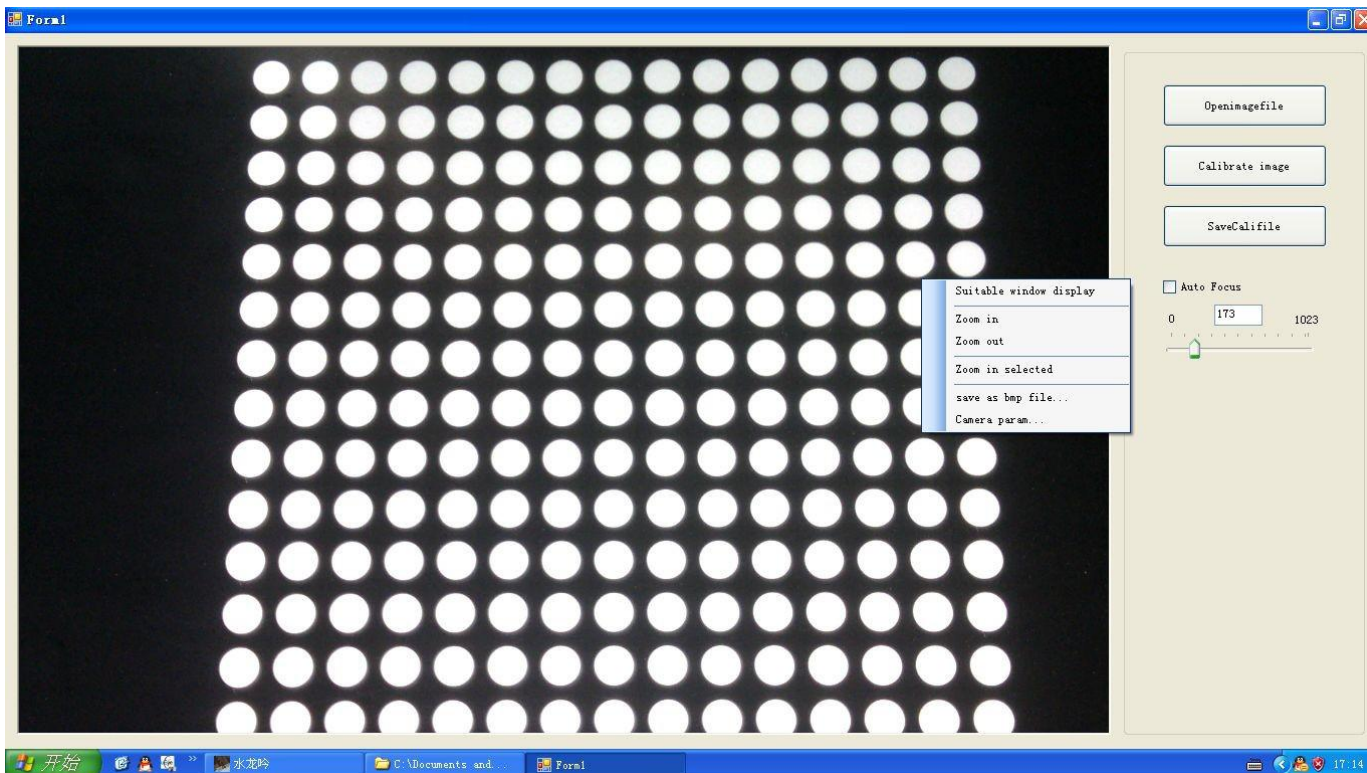
(2) Make the files in the Ezcad2-lite pro software.

- Set point array (number of the point must be odd) .【Please remember point distance, it will be used in CameraCali.exe again】
- Like the follow , the point diameter is 5mm , point distance is 7mm,number is 15X15 .
 - Number of x and y direction must be odd, but can be different.
 - The number and distance will depend on the marking area.
- Mark the point array then can not move it



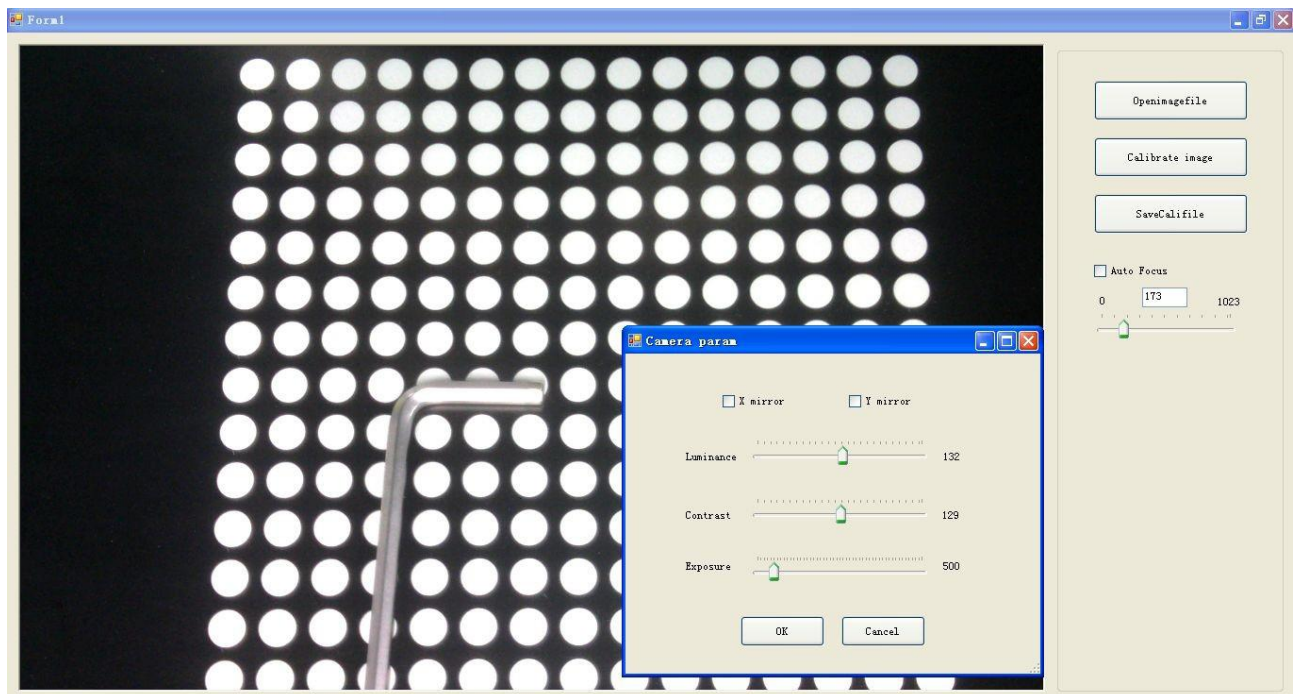
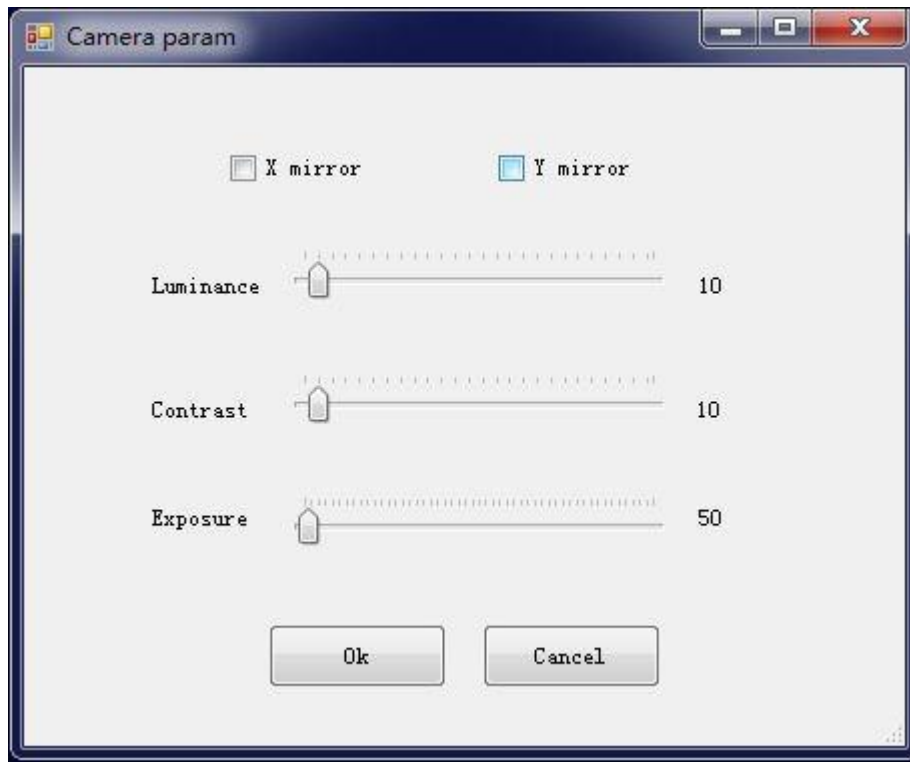


(3) Double click  , Open the camera calibrate software , click right keyboard in view area,will show follow .

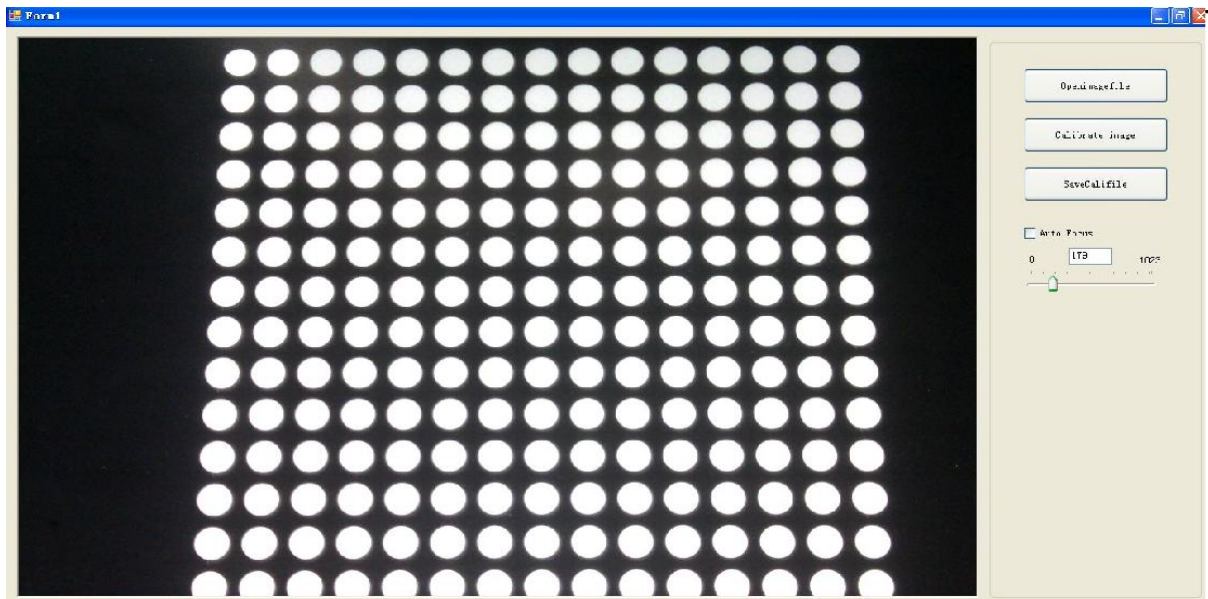


Suitable window display	Suitable window display: Camera view area same size as workspace
Zoom in	Zoom in: Zoom in the image.
Zoom out	Zoom out: Zoom out the image.
Zoom in selected	Zoom in selected: Use mouse to choose the area you want to zoom in.
save as bmp file...	Save as bmp file: Save current show as bmp file(user don't need it usually)
Camera param...	Camera param: Click it can set mirror,Luminance,contrast and exposure.please make sure the view image same as real object.

(4) Click “Camera Param”, Adjust the XY Mirror , Match the displayed image with the visual direction.

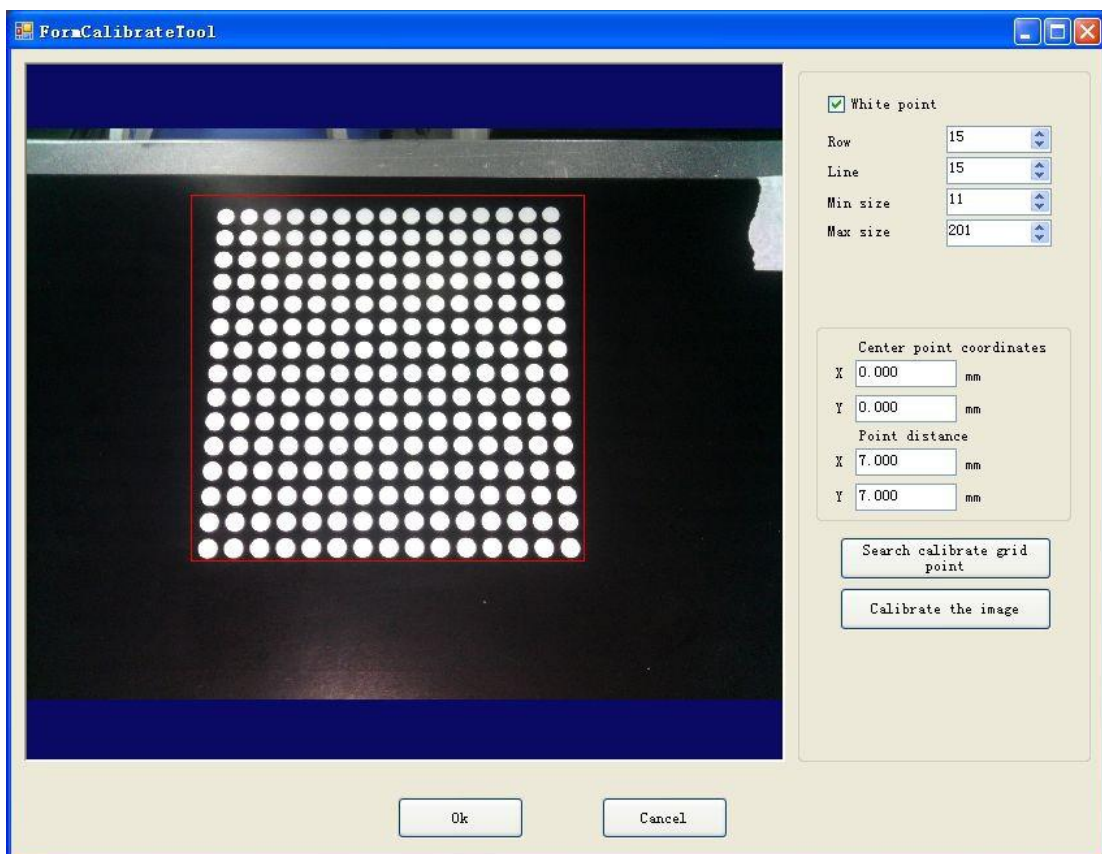


- (5) Adjust the camera parameter , Make sure every point is clear to see, and no other light noise,as fig:



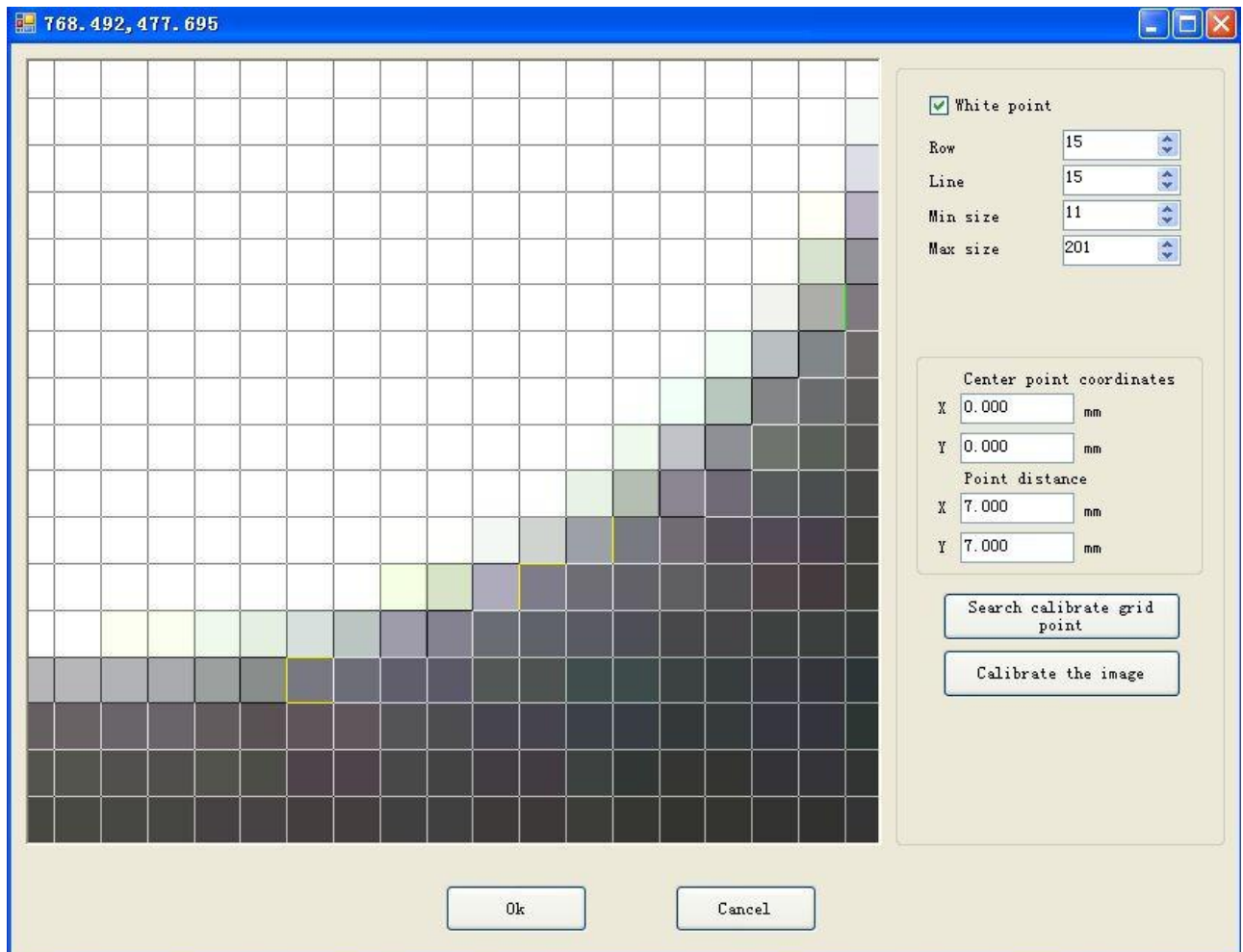
Auto Focus: system will automatic focus, if not, will be handle focus, the value is 0-1023

- (6) Click ‘Calibrate the image’



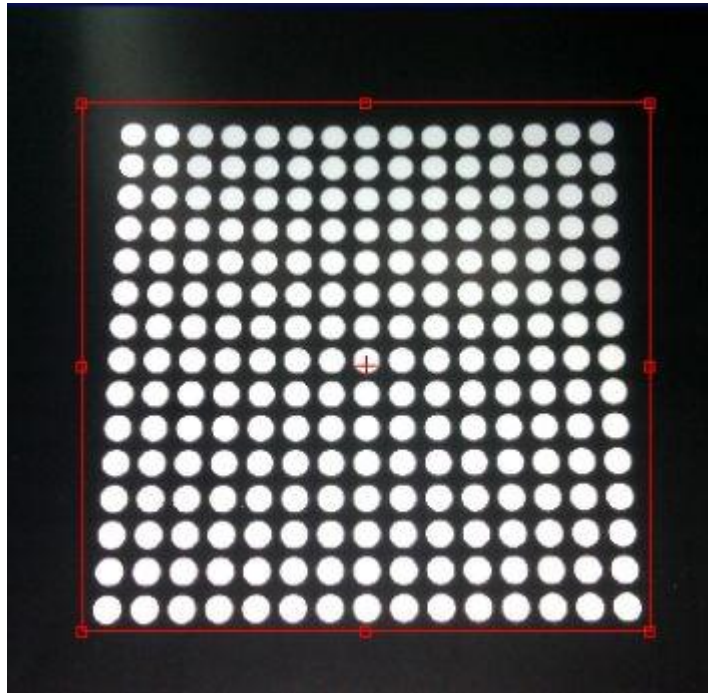


- **White point:** when the point array is white color, please click it.
- **Row&Line:** Row number and Line number of the point array.
- **Min size&Max size:** Pixel number of each point. 【Move mouse wheel can magnify it, and can see the grid as follow picture, count the number of the grid in one point, set max and min size to make the grid number between the min and max pixel number.】

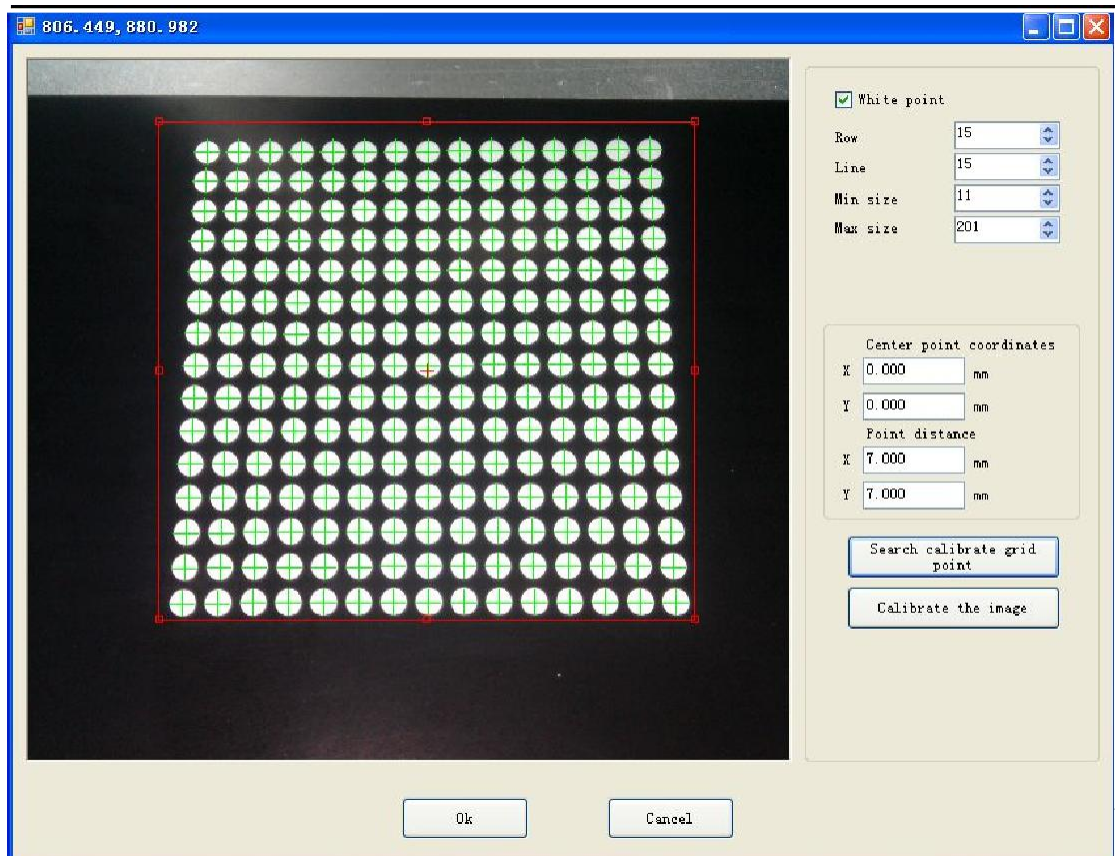


- **Center point coordinates:** coordinates of point array center that be chosen.
- **Point distance:** distance between two points in the point array.

- (7) Then draw box to make it cover whole point array, the center of the red box is repeat with center of point array.



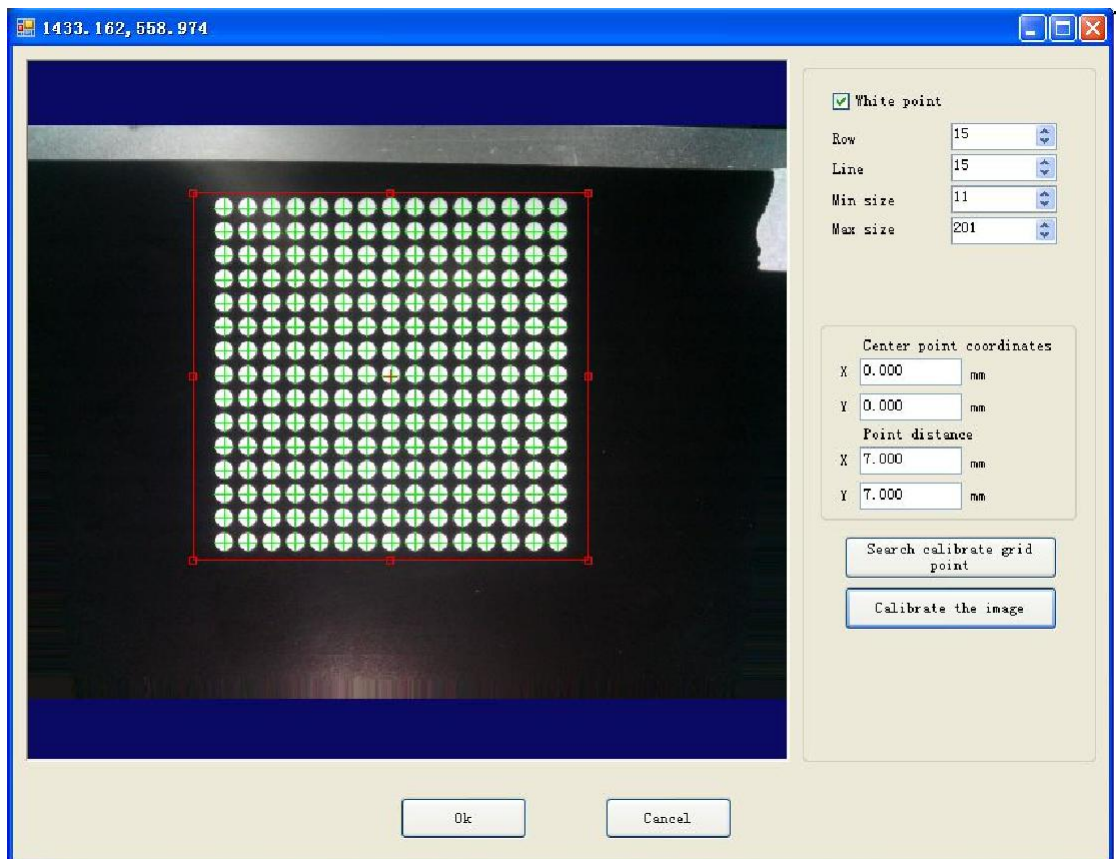
- (8) Click 'search calibrate grid point' then will show green color of cross in each point center.,



- The software will show error message “Fail to find calibrate point” once there is no cross in any point center.



- (9) Click ‘Calibrate the image’ will find the image change obviously.



- (10) Click OK, save calibrate file 【Please remember the saved path】 .



4. Loading the camera calibrate files.

Open Ezcad2-lite software folder . Copy the camera calibrate file into the software folder . Open the folder RES, then **param.ini** , make some setting.

CAMERACALI=1

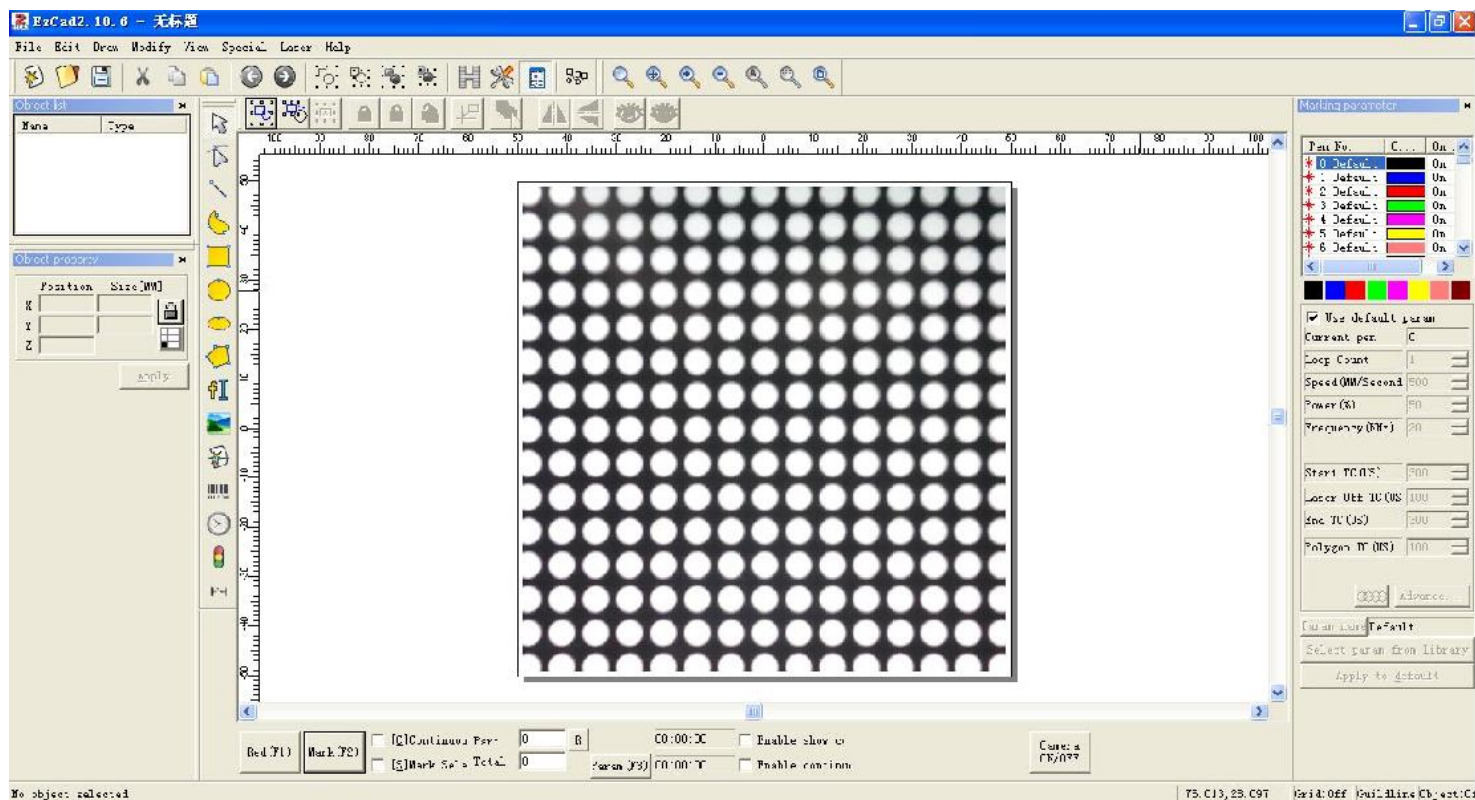
CAMERACALIFILENAME=CameraCalibration.cal

- CAMERACALI=1: Enable background show calibrate file.
- The camera calibrate files must be into the software folder.
- CAMERACALIFILENAME=CameraCalibration.cal (the name must same as calibrate file name.)

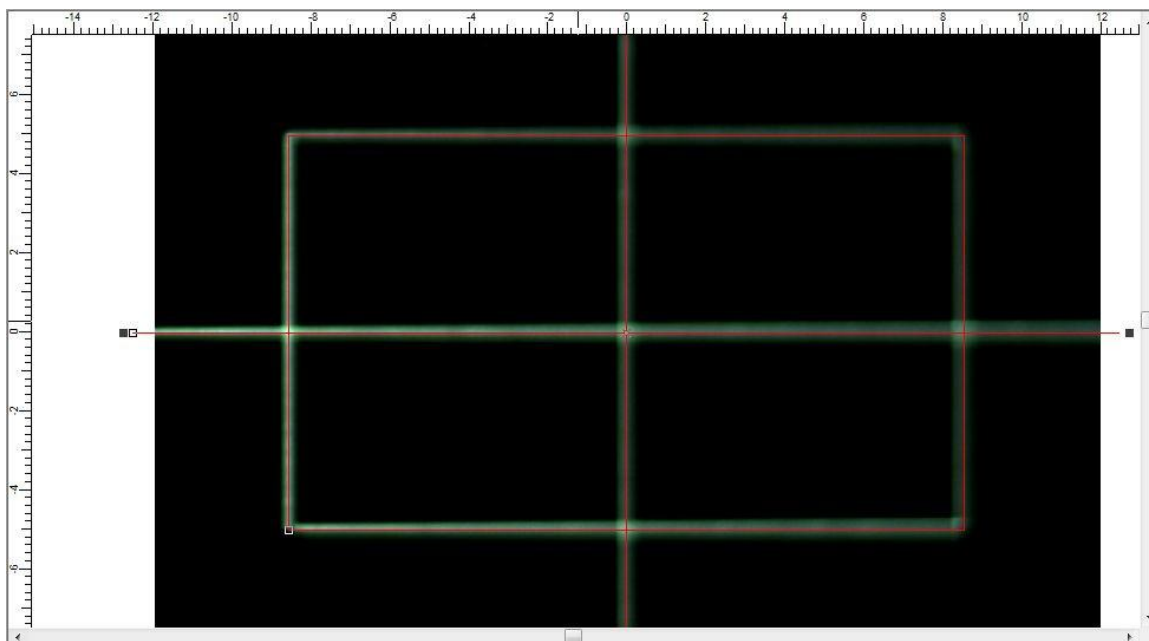
5. Test the camera calibrate

Now open EZCAD2-Lite pro ,it is already finish calibration, so can make mark position same as the position you see in work space.

(Please don't let the PC becomes dormant, or the software will stop work)

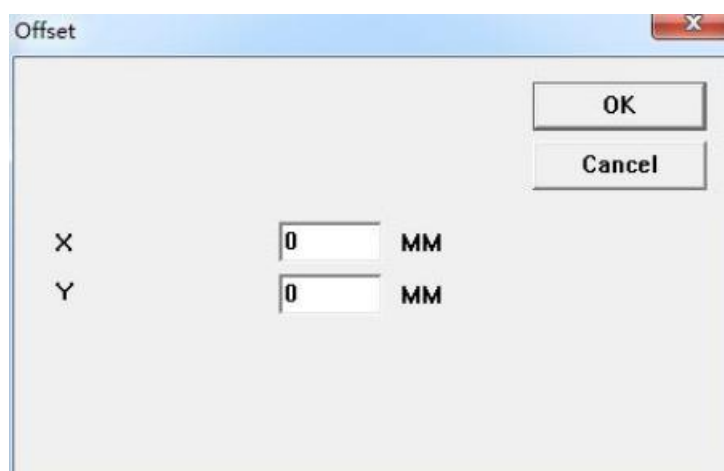


Follow is one example, red lines is what we wants to mark,white lines is what we marked,from the camera view window, we can see they are totally cover.



Because of some person reason,maybe after calibrate, the drawing object and marked result is not totally cover.

- Click right key in the view area and choose 'Camera',will show follow window,
- Change the value of x and y to calibrate the small position difference.
- **Note: before calibrate make sure both of the x and y is 0**

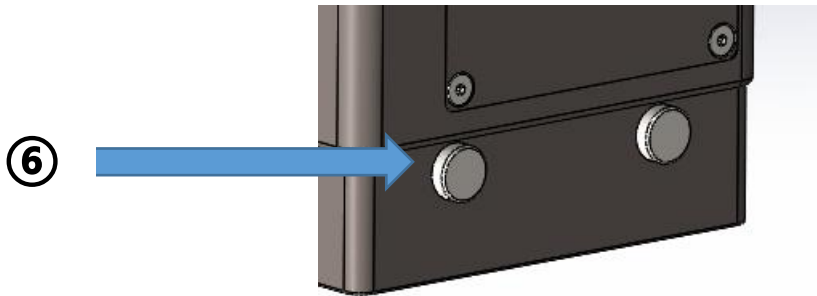


Chapter Five :Adjust Pilot Red light

1. Find the laser focus

(Check Chapter 4 , step 4) 【 If it has been found before, do not repeat the operation. 】

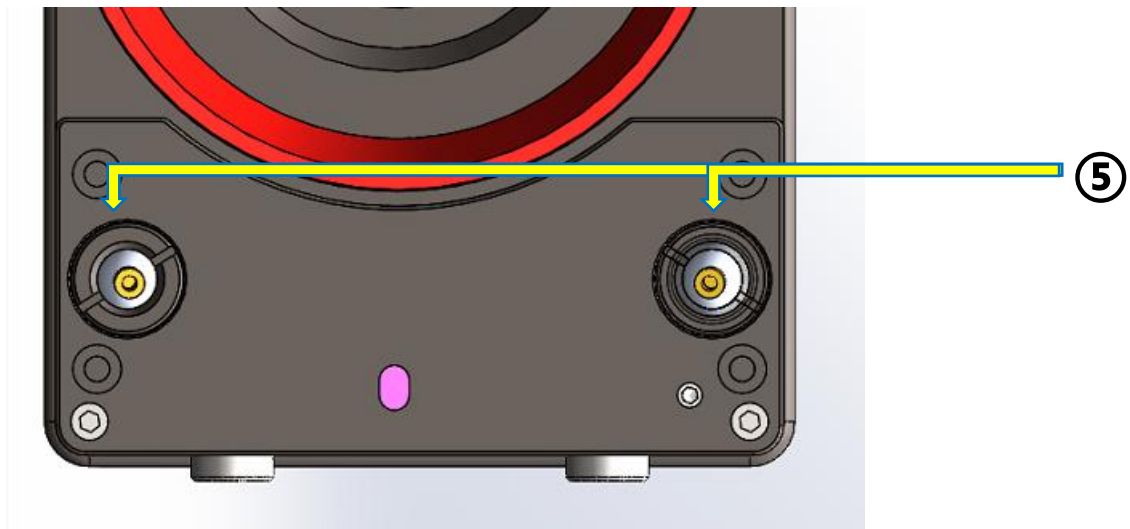
2. Press Pilot button.



3. Adjust the red point

Move the red light so that the two red lights focus on the same point.

- It will be more convenient to adjust one first and then the other.





Chapter Six : Notes

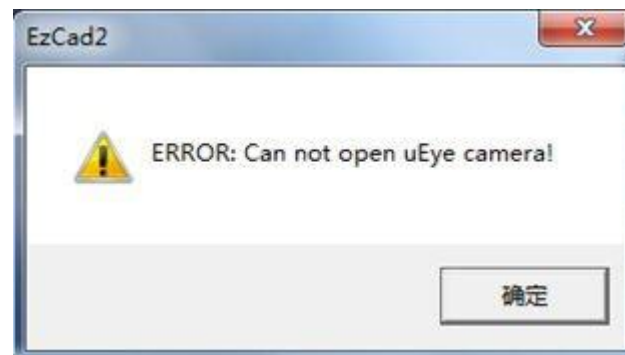
1. For calibration

Any small changes in the laser path will bring great changes in focal length and calibration, which will affect the accuracy. So better to make the new .cor file again after twisting or change the f-theta lens.

2. Pay attention to wavelength and Aperture

For different types of scan head, the wavelength and Aperture is different especially the Aperture. It can get the best marking effect only with the right aperture.

3. Camera type error:



Please change **CAMERATYPE=JCZUSB** in the **param.ini** files in folder **RES**.

4. No camera On/Off button.

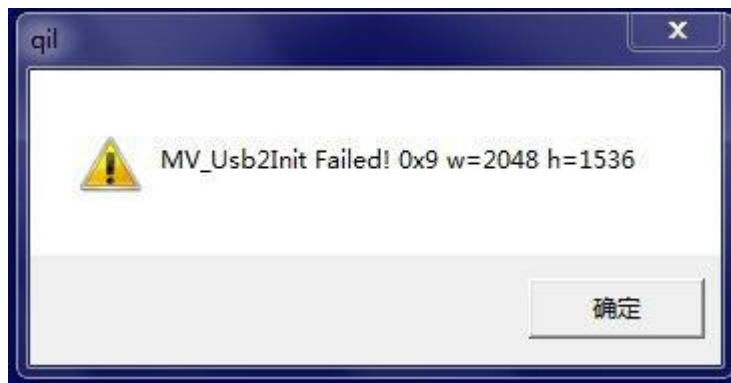
- Make sure the scan head is **G3 pro-v**
- Please change **CAMERA=1** in the **param.ini** files in folder **RES**



5. No camera calibrate.

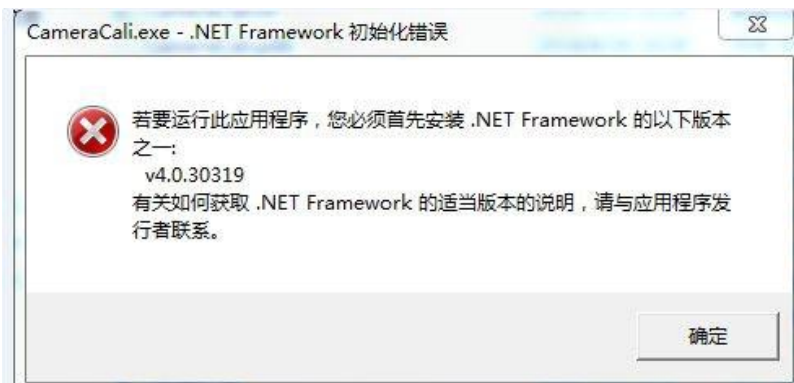
- Make sure **CAMERA=1** in the **param.ini** files in folder **RES..**
- The **camera calibrate files** must be into the software folder.
- **CAMERACALIFILENAME=CameraCalibration.cal** (the name must same as calibrate file name.)

6. CameraCla software error



- please login EZCAD as Administer,then in the future will not show this error.
- If still show this error,please check whether the CameraName(in the file of CameraCla.ini) same as the camera.
- CameraName=JCZUSB

7. .NET Initialization error



- Please make sure whether installed .net in the computer.



8. No license or Invalid License

Please contact with JCZ ask for the license.

