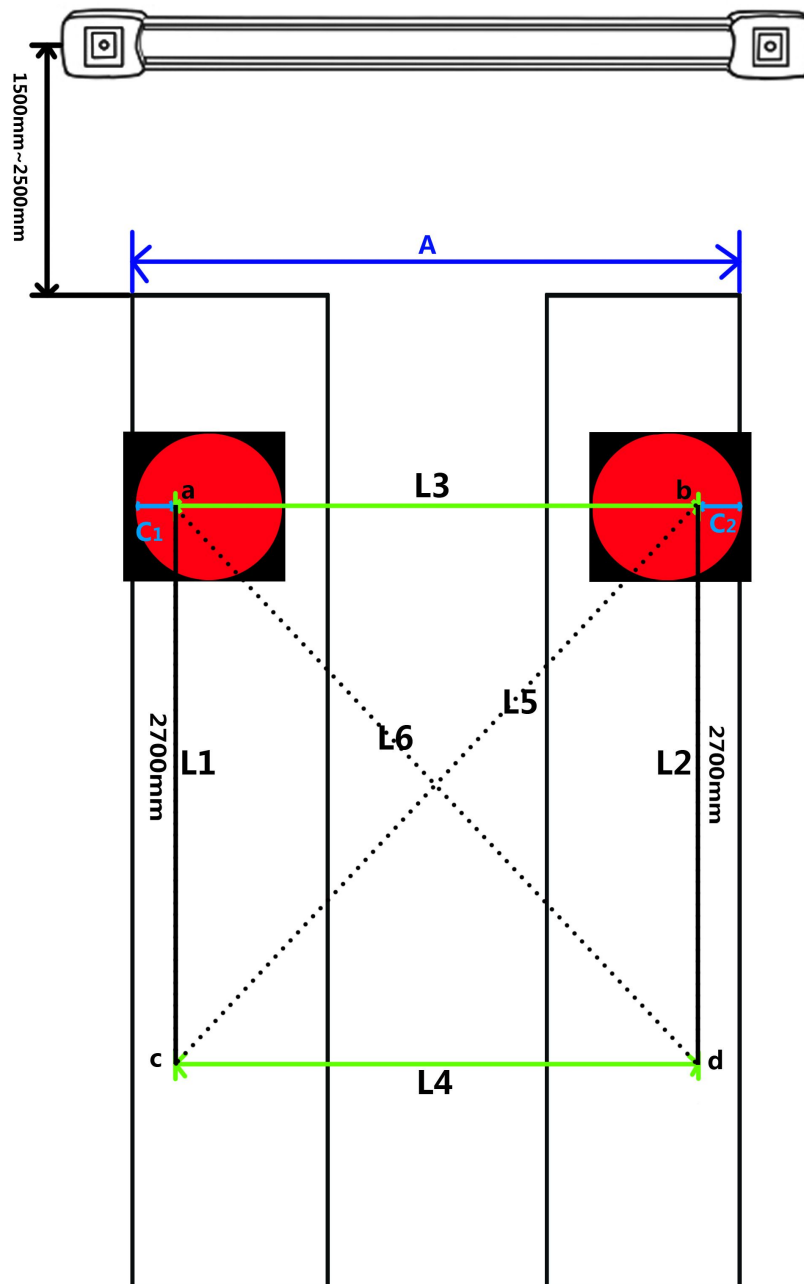


Hardware preparation before calibration



Goal: Confirm the conditionsof the calibration bar in the lifting machine.mark it.
(tools: chalk, tape measure)

Steps are as follows:

Step1:

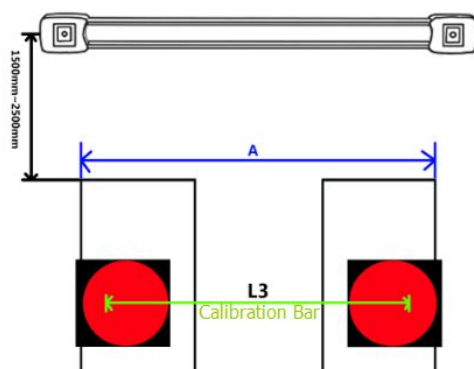
- 1) Confirm the conditions of the camera beam and lift .
- 2) Distance between the camerabeam and the lift should be 1500mm~2500mm.
- 3) The best distance between the front calibration bar and the rear calibration bar is 2700 mm.

Step 2:

- 1) Measure the width of the lift. Denoted by **A**.

Step 3:

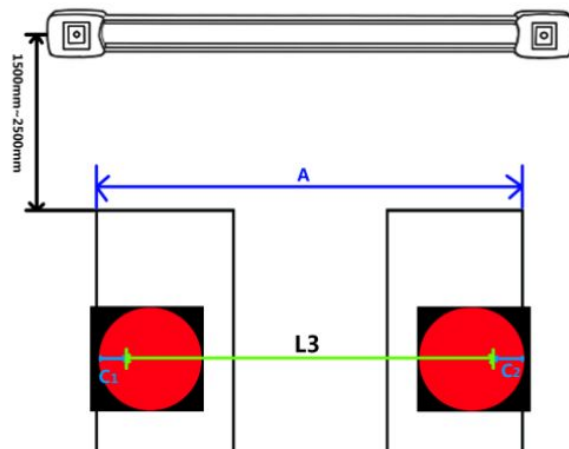
- 1) Measure the length of the calibration bar. Denoted by **L3**.



Step 4:

1) The distance of lift and calibration bar is: $(A - L3) / 2 = C = C1 = C2$.

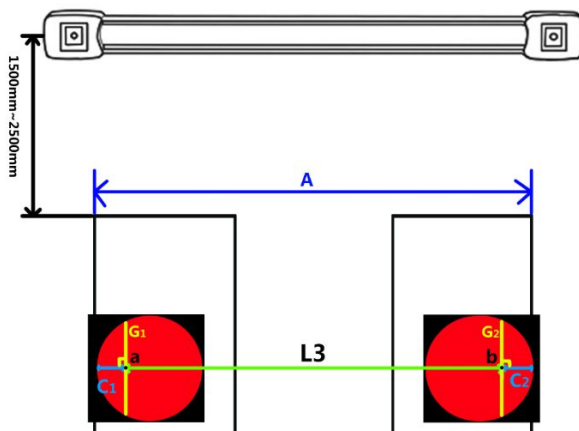
2) Confirmed line C1 and line C2 on the front wheel turntable.



Step 5:

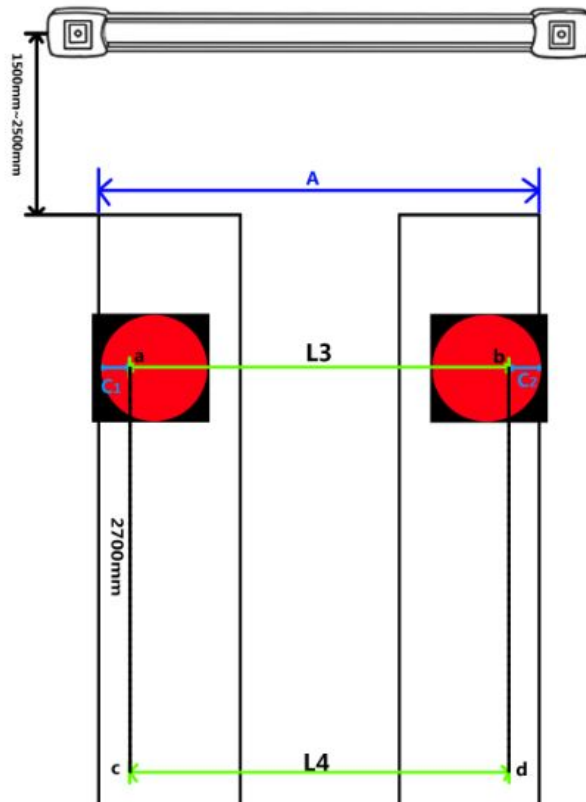
1) In the corner of C vertical line G1, intersection point a.??

2) The method of finding point B on the right side turntable are the same)



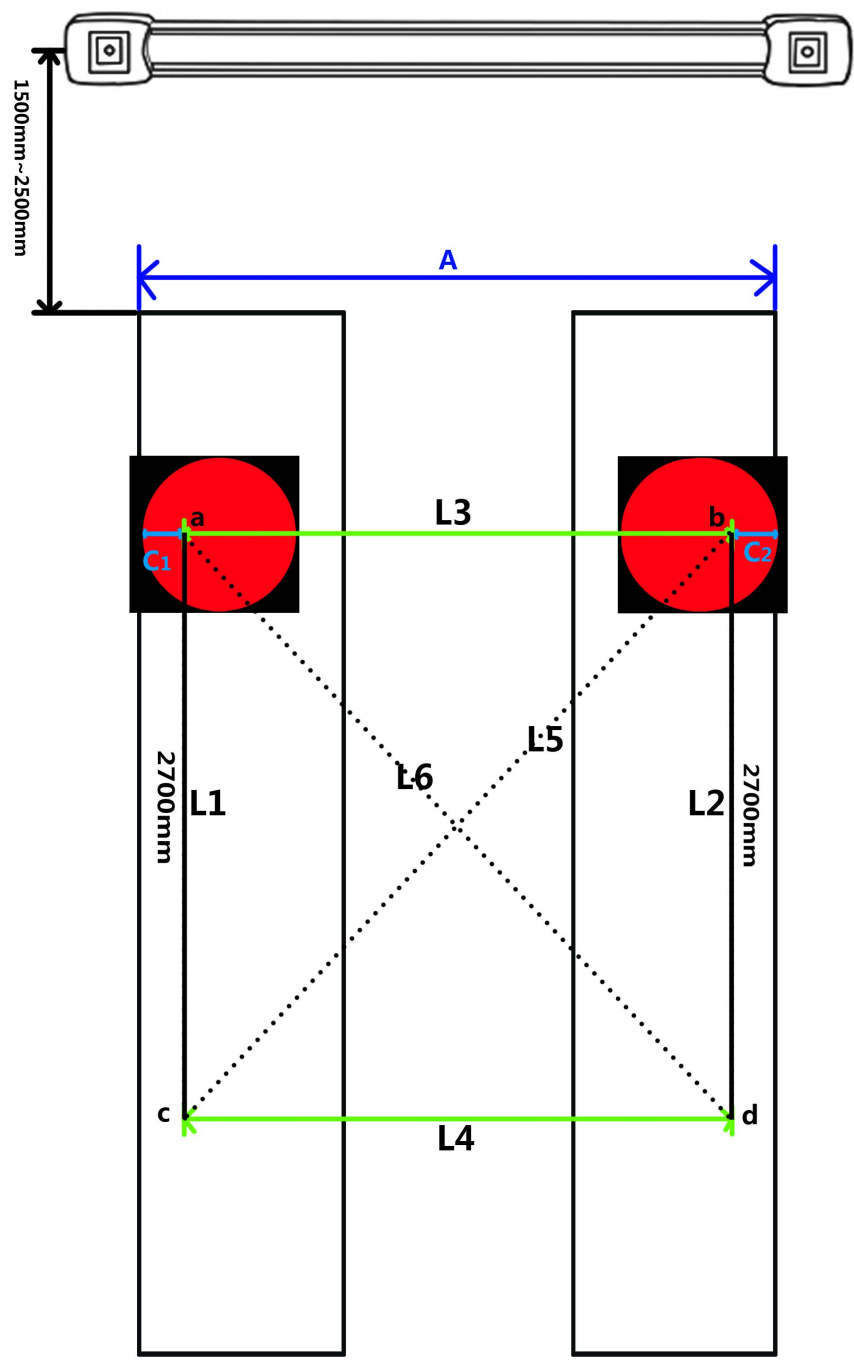
Step 6:

L3 translation 2700 mm to L4. Determine the position of point c and d in the rear calibration bar.



Step7:

Please make sure: $L1 = L2$, $L3 = L4$, $L5 = L6$. and quadrilateral abcd is a rectangle.



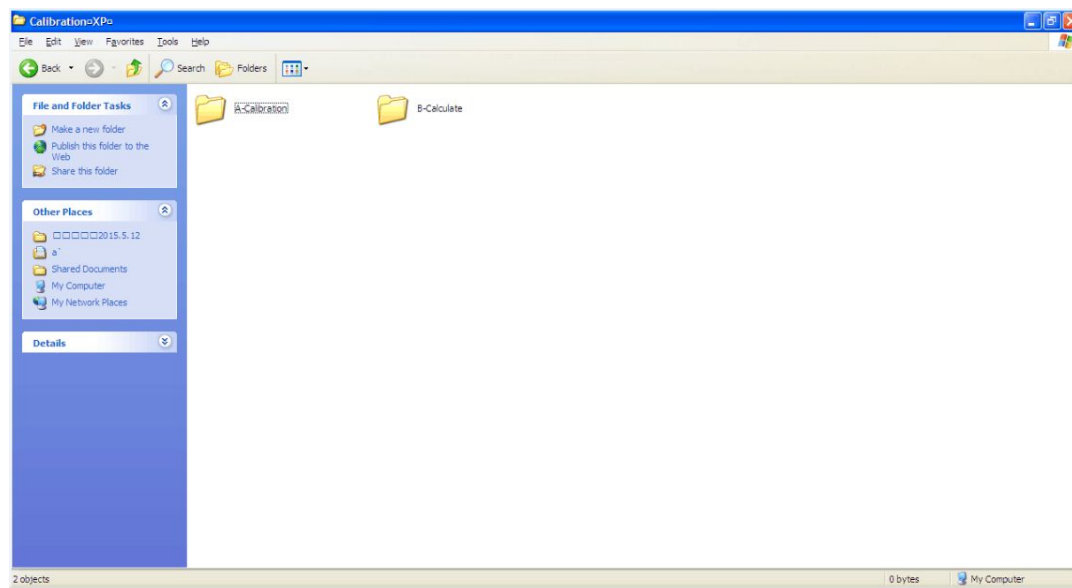
Calibration

Attention: Make sure the camera is working.

1. Double click **calibration (xp) exe**.icon.



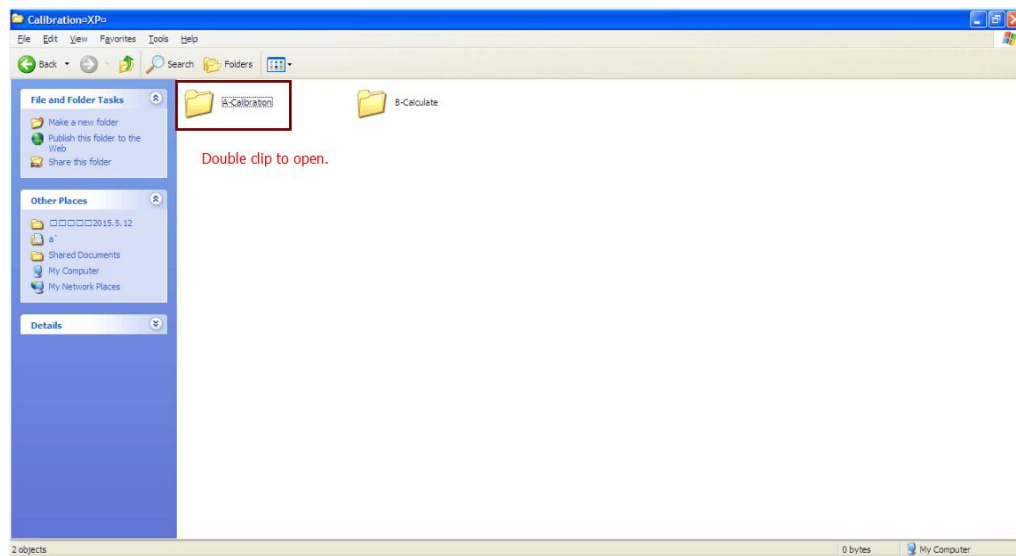
2. Find **A-calibration folder** and **B-calculate folder** showed in the interface. As follow:



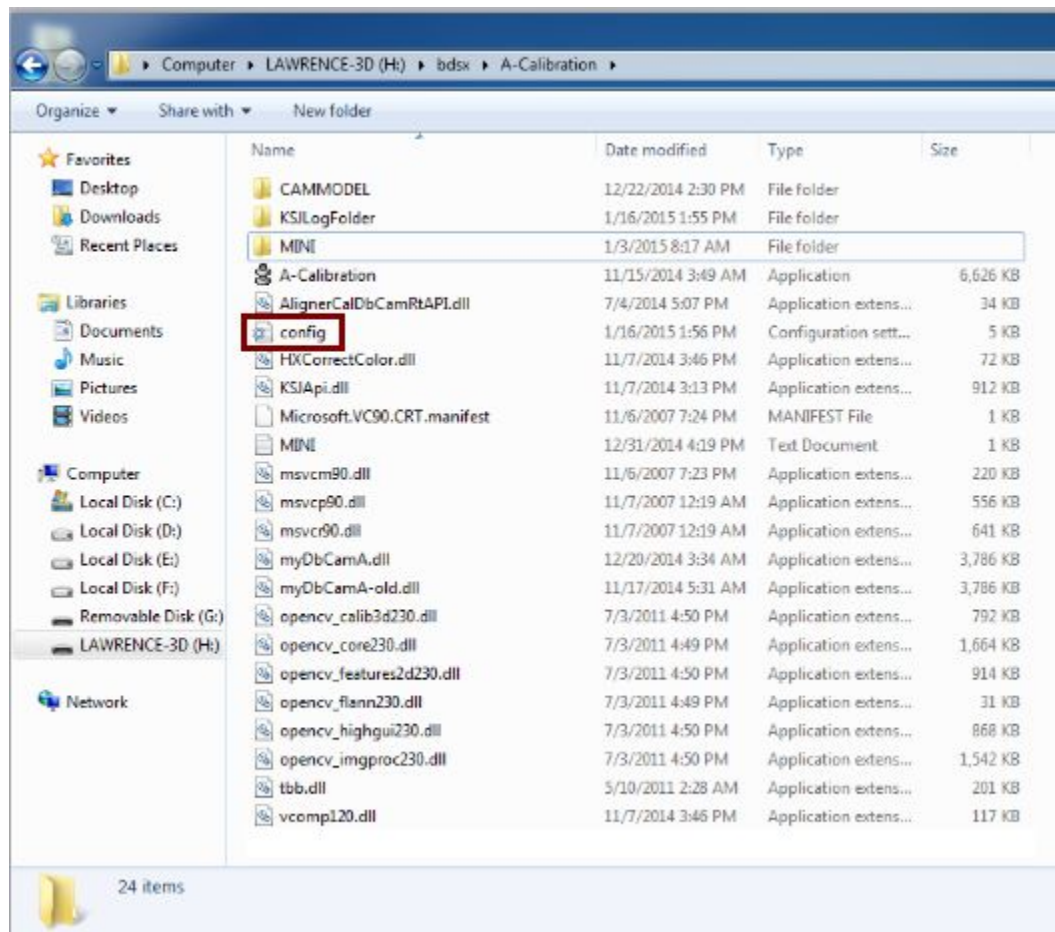
3. Input **dongle** to **USB** port in computer.



4. Double **click** **A-calibration** folder. As follow:



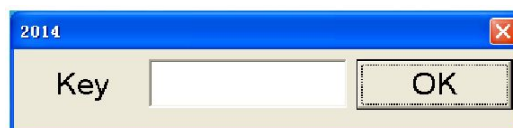
5. Backup config.ini to other folder,save it. Then copy this **config.ini** document to **A-calibration** folder.



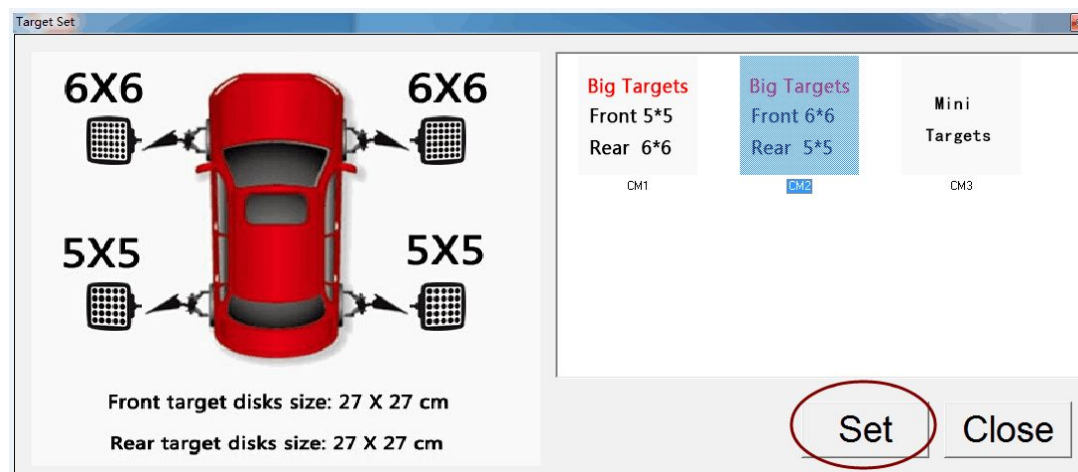
Attention:

The lawrence program can work in the computer systems of windows xp, windows 7 and windows 8 computer systems. For windows 7 and windows 8 computer systems, run as administrator is required. (right click A-calibration, choose run as administrator)

7. Double click **A-calibration.exe**. Icon. Input password: **10086**.



8. Choose the suitable target type,enter **set** to continue.

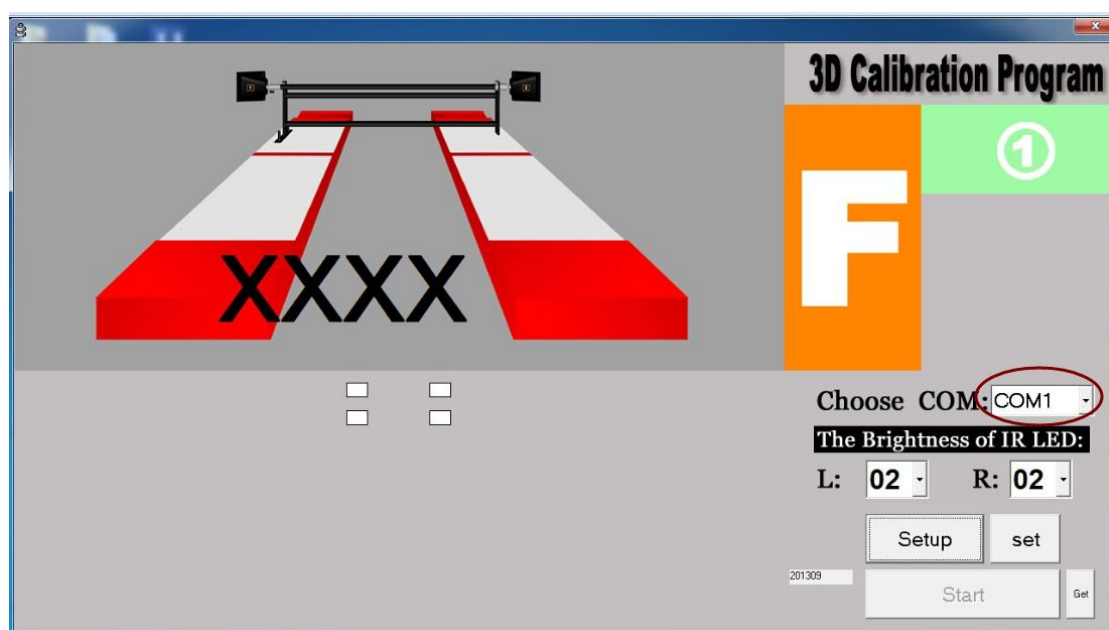


9. Choose the suitable **COM port**.

How to confirm **COM port**?

Method 1: Desktop-right clip-choose **device manager**-find COM PORT to confirm the COM PORT number.

Method 2: Check the **config.ini** to find **com=COM***, the * is the COM PORT number.



10. **Take** the calibration bar to the confirmed position.(L4). Enter **setup** to check target picture in the software. If it is clear, enter **star for** next step.



11,

Attation:

- 1) **The interface** will show red,green,blue line on the camera picture **on the screen**.
- 2) “**Beep**”**sound** means it can goes to next step.
- 3) 20 ° yellow arrow mark means the degree need to roated.

14,

- 1) **The interface** will show red,green,blue line on the camera picture **on the screen**.
- 2) 20° yellow arrow mark means the degree need to be roated.
- 3) Roate calibration bar backward to **19.70° ~20.30°** ,software will grasp the picture automatically.
- 4)“**Beep**”**sound** means it can goes to next step.

Black data means the degree on thecalibration bar rotaed.

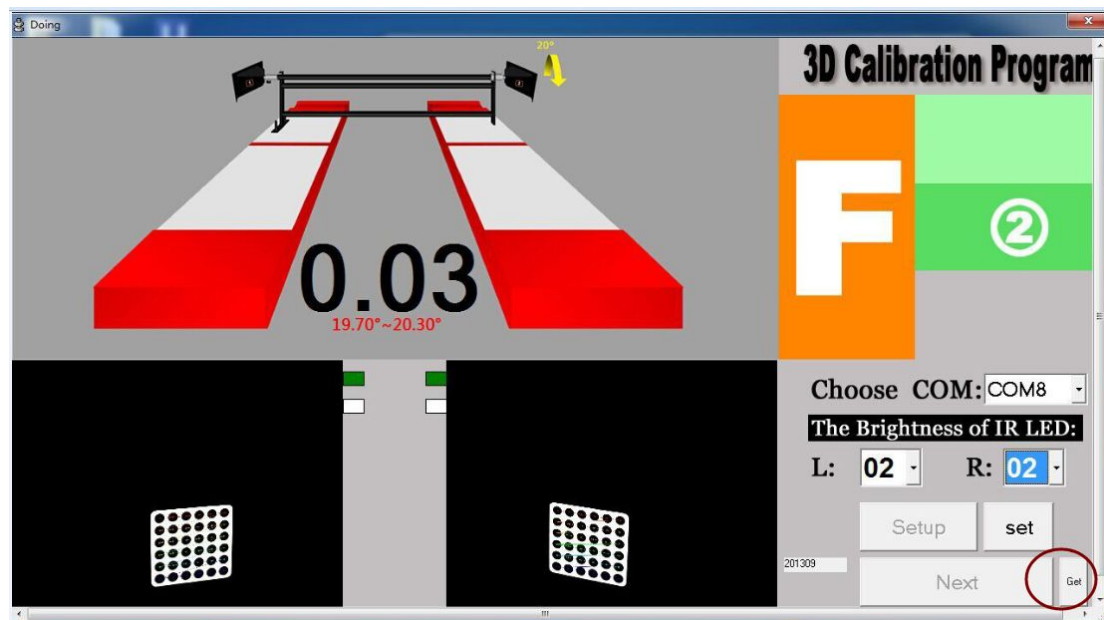
Red data means the range value (**19.70° ~20.30°**) .

Attention:

- 1) Rotate calibration bar backward to $19.70^{\circ} \sim 20.30^{\circ}$, software will grasp the picture automatically.
- 2) “Beep” sound means it can go to next step.

If software can't take picture automatically, you can enter **get** to next step.

Reasons for cannot grasp automatically: There are continuous vibration source surrounded.

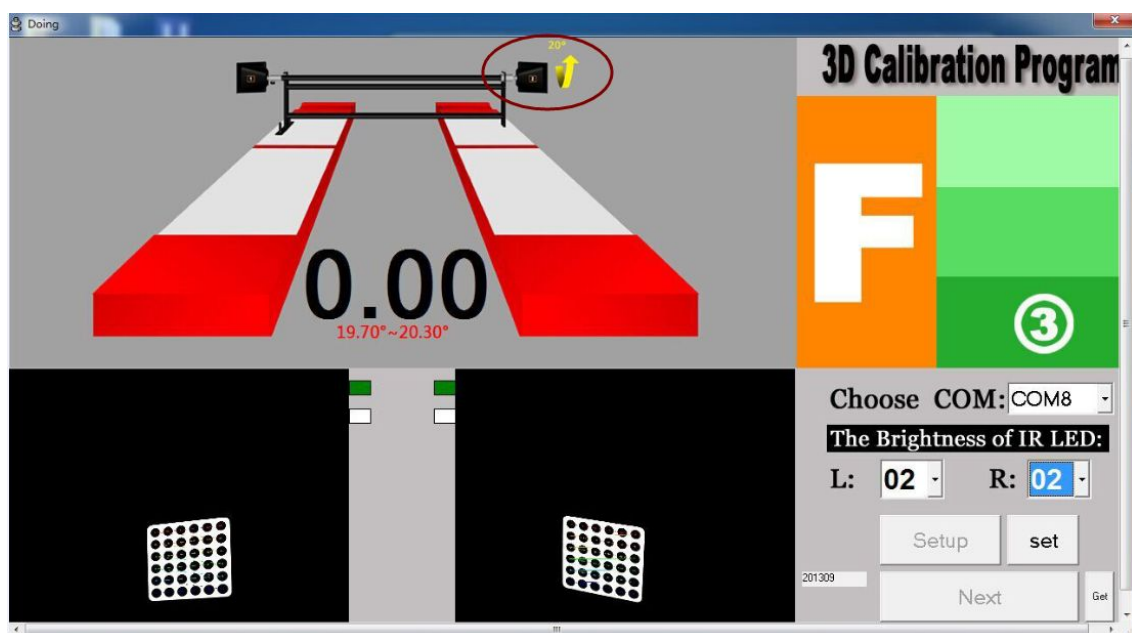


Key point: both hands grasp the bar to rotate the bar stably and smoothly.



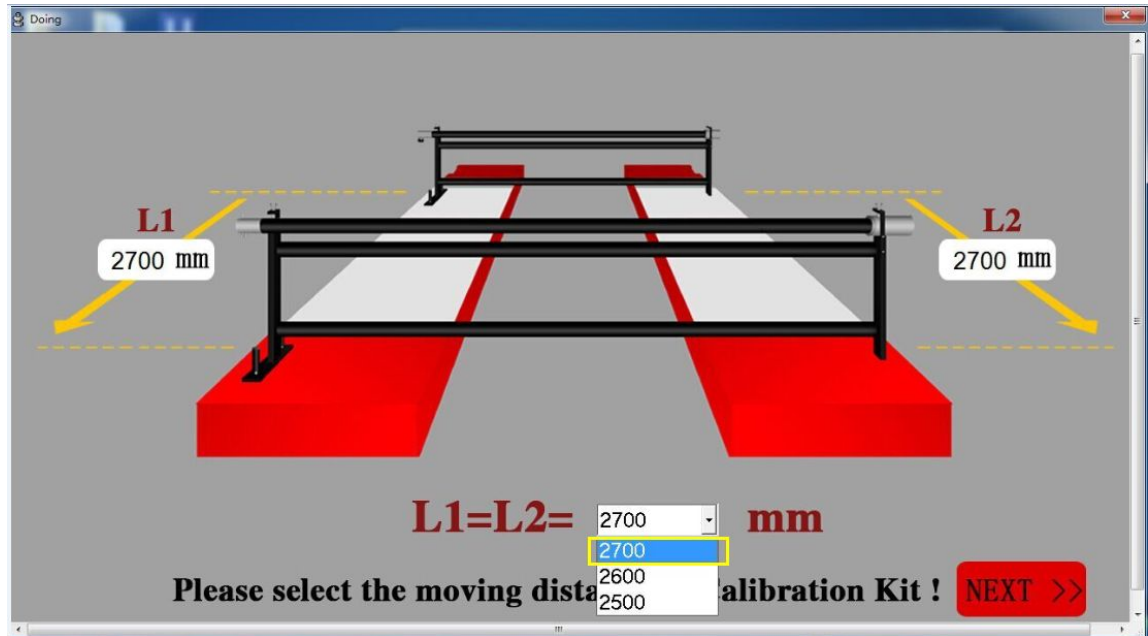
Attention:

1. Roat calibration bar forward to $19.70^{\circ} \sim 20.30^{\circ}$,software will grasp the picture automatically.
2. "Beep"Voice means can goes to next step.



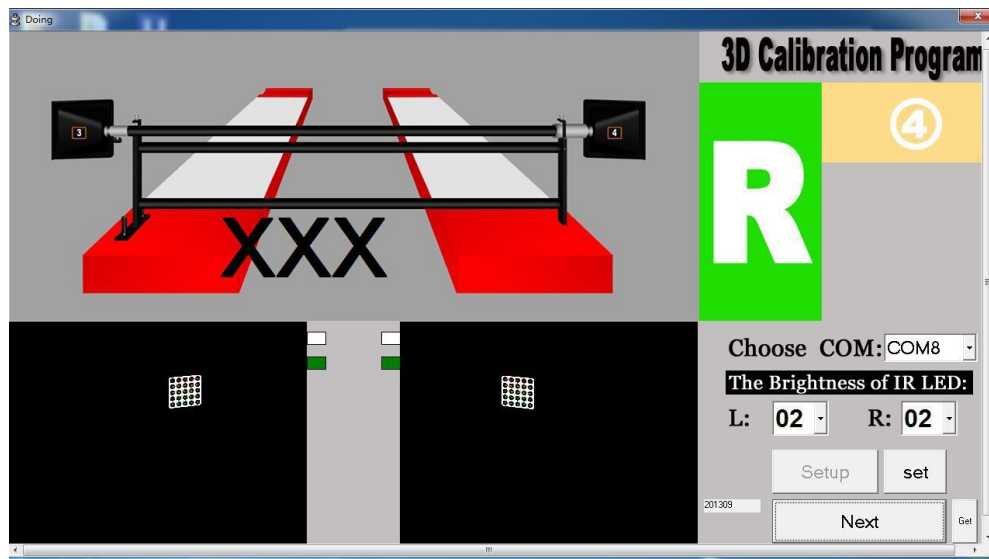
12. According to actual situation to choose the distance between front and rear.

Note: $L1=L2$. Then enter **next** for next step.



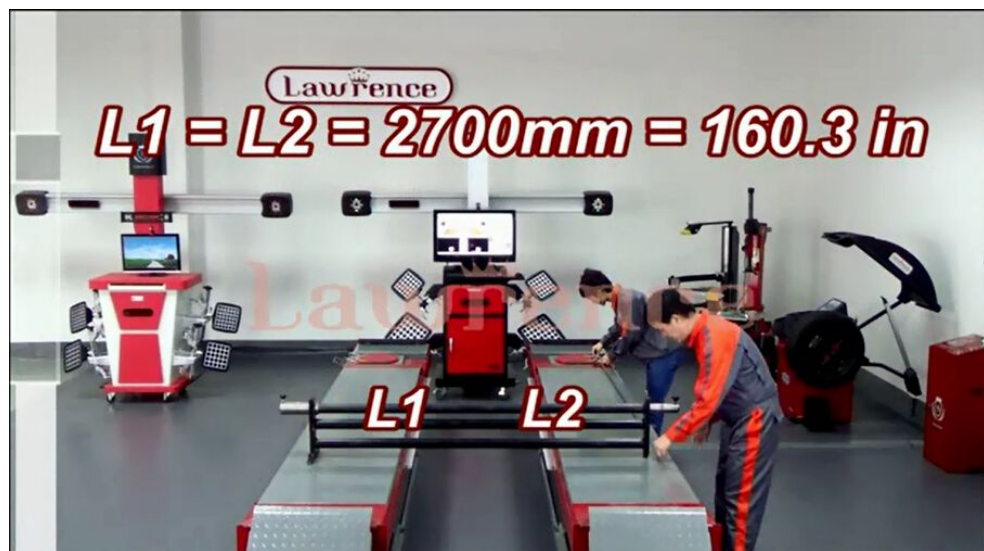
13. Dismount the target, and move the calibration bar to rear position. 2700mm from the front. then enter **next** to next step.

Dismount the target. And the parallel translation the calibration bar from front to rear position where marked before .



Attation:





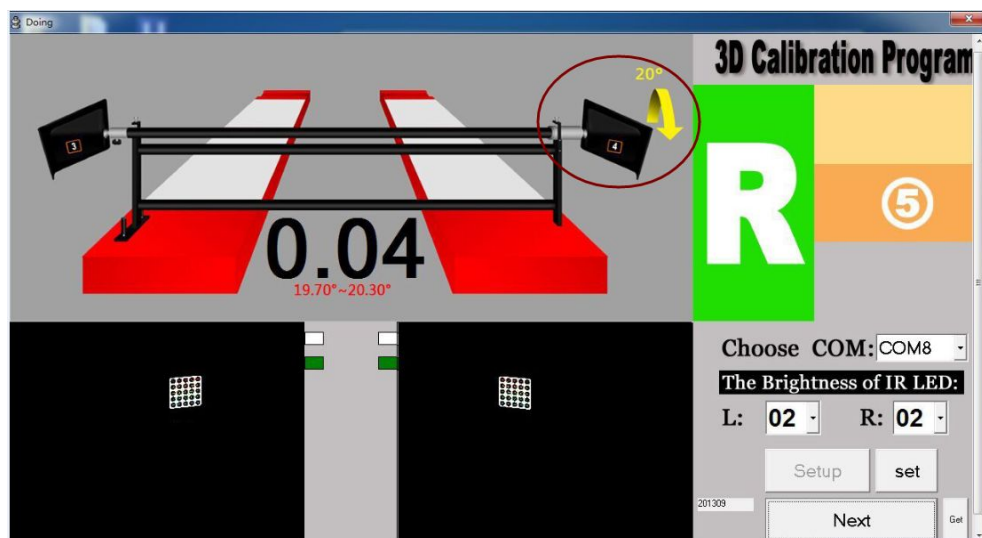
14,

2) The interface will show red,green,blue line on the camera picture on the screen.

2) 20° yellow arrow mark means the degree need to be roated.

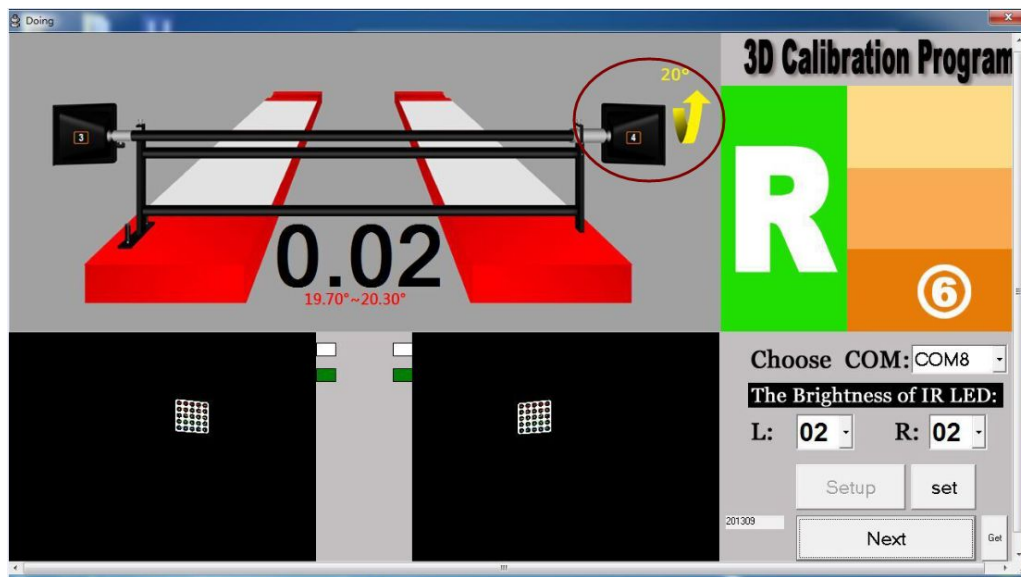
3) Roate calibration bar backward to $19.70^\circ \sim 20.30^\circ$,software will grasp the picture automatically.

4) “Beep” sound means it can goes to next step.

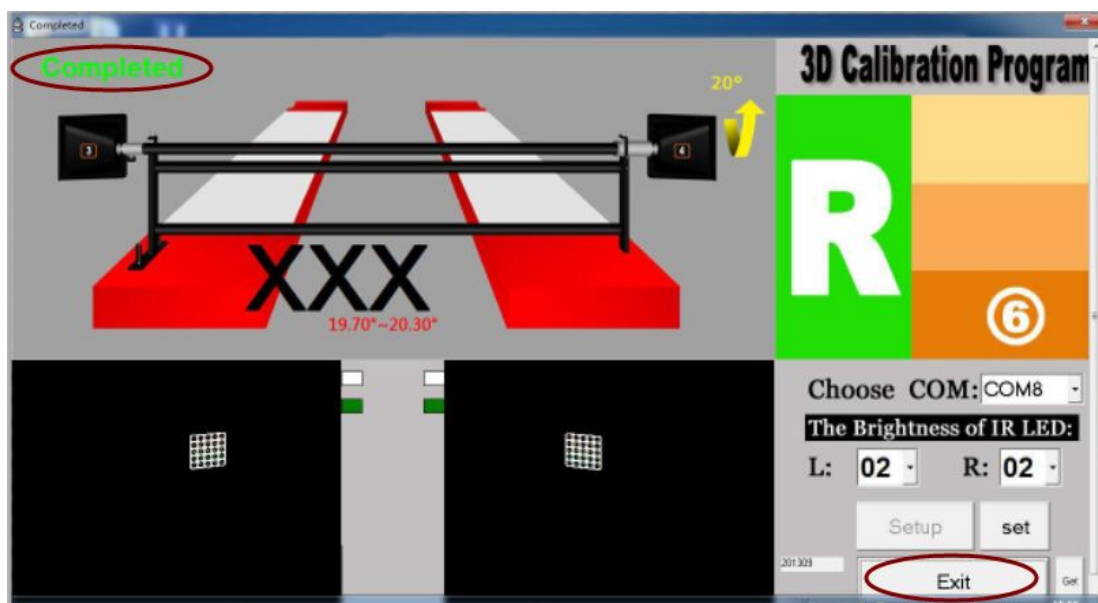


15. Roate calibration bar forward to $19.70^\circ \sim 20.30^\circ$,software will grasp the picture automatically.

“Beep” sound means it can goes to next step.



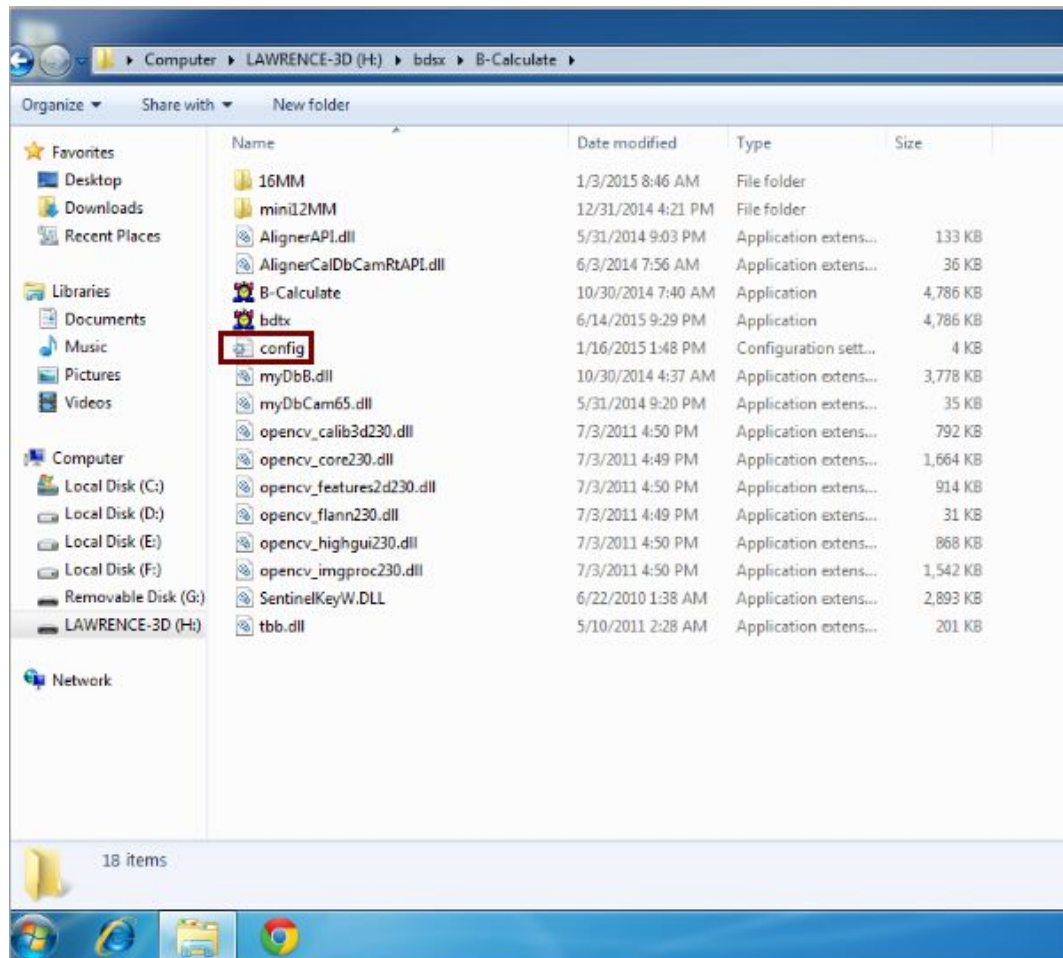
16. Finish rotating, you can find word:Completed. Means finish. Enter **exit**.



17. Find document config.ini in A-calibration. If you can find the data in last line as follow, means the calibration finished.

```
[DbCaliParam]
RT_L_1=AC+smA2wUJ34nbpB2q3fW4gscEeWznNfabW0FqWxjW4as0JZYkw7V1KCoD+agrYDgc77wG+oG4AVEg4LW1zaYWTI1MOKfzeq1Jus4NK2zSm0hxW0/q693ipFq0=
RT_R_1=yRtZX5DU1Lih1OWYsbJbojL7yR8gJSpJ1U20Ru7pV6TD1ESkpMzcVFobjxCE9GDjVDvfkgmkXuCu2jGSIIoi1D4STUp1v7ufv70g7vueCy90ZSJ1Wex0kds
RT_L_2=tnfi2fRdA3ghNf1VHrphHQhg5UUCfP04U9TuepQ9YgWY6v/+rw7Y8wMAoTyS4Z90i10BPAAUH5SVdIYawUWR/VrA/n4stSPzd80QPh81zEN0pr+i/SJin1S6FhD=
RT_L_3=92vpBU56QcsHqqlsxy0De+TZMV0LgiIi4wWG6in88TS1XJKpSGSPGHtbiy/KawqwiV1VZ1eDAGPGXZ8RzS25z/T+3Qc1M7hcrAt1GLMzr/31ruqJepTHGCqmrwI=
RT_L_3=4+7g4JFR1oKhPSqNxiQzSfrGoCQnjcNsBksFR09J/Vubri11+uSIyJSIoSojXS8t0coD/QZDHJkdCCzNYs034c3fslc9+KL2Xadgcgh8Tz6z87sMjd8guBsjEO=
RT_R_3=dN9WVWkCR3VhfIXV81Y+8x+cFsN3EjRctie/65LEdF3f10XMQ1BAwtTPXCDseVco049xeNab1Wb0F140++uIQmTd1S61f77+JaIdcjbT+1FSbkqh1nq+XTe
RT_L_4=uqUeoY/NIUc0hHBO+c1ZkEwiWehbA71D0nHSRrFKKe4U3kqbvPRqpSxaHHRdBaCfwzumiS29sSC+Mnp1mo1AXOQ6TP1Y/MYoIVzkQK3irQqZD1PVP9pERF2C==
RT_R_4=39op322ULSiTm0fk4fTL7wv0Azu2TjoIG5MU4pwXg41bfAqYJw4Ow7b4Zkw6NF91+uIdm/00fSwPXIdL3MS3mtysgn2YL7+mq10yE7/pBdTX9D6wOX1zvwNB==
RT_L_5=7jZ23KKBpJS23UQhejd1MslwiHQgu71e4SnC0kuV05oEGHG1eCbRjpr8UK7bUpad8YJY9QCE/8/qsANZOfE6iGkn/HuwxygUYbFY6CsWcNRtCLSY/PoKJr
RT_R_5=Bb/3i0Acx6Z3ekQ/HtdiUNnVLN0W9k41LJx6ScZImzLTxtvBC8cUtyl1L11pd63NhgRr+MLIUB6AC6zEophV9AydLgiXpsV2Eu73TTZwYbMOeDHgPZ9oFKgbdta
RT_L_6=Ao9i3LV3LLrXDcuLEt6k0Dmpc/JI5E1aHUNuFIRFG3HYReWe3EaHys7hJApMZ1MVRxg+dmjPRAlaykvwxRMvpGq2TVEso2rYhpA/vp10awD2sc/FFpih04P8D==
RT_R_6=HQ+KQRy4YTvmNB81cZ7siW7Q3yy01X23MQyX6FcLLIU8TdKnMfz+sSGbCrrpaoPjoa/TLOGoI5wCctbX++5Vey8h13nDjmcLkZMv3JqEuf9RJYB4cfCY7j0wRA==
npA-7700
```

1. Double click open B - calculate files. Copy the new config.ini document to B -calculate.



2. Change the **Dongle** for **Calibration Dongle**.



3. 1) Double-click to open the **B - calculate.exe**. Icon (if use windows 7 and window8,must operate as an administrator)
- 2) Enter **calculate**,you can find word"Waiting" On the top left corner, means software is caculating.

A screenshot of a software window titled "Bkh(2014)". The window has a blue background and contains several input fields for "F.L.Camber", "R.L.Camber", "F.L.Camber", "R.R.Camber", "F.TOE", and "R.TOE". There is a red text label "remain 78 DOG LLS" and two buttons at the bottom: "calculate" and "close". The "calculate" button is circled in red.

Bkh(2014)

F.L.Camber	<input type="text"/>	F.L.Camber	<input type="text"/>
R.L.Camber	<input type="text"/>	R.R.Camber	<input type="text"/>
	F.TOE	<input type="text"/>	
	R.TOE	<input type="text"/>	

remain 78 DOG LLS

calculate **close**

waiting...

F.L.Camber	<input type="text"/>	F.L.Camber	<input type="text"/>
R.L.Camber	<input type="text"/>	R.R.Camber	<input type="text"/>
	F.TOE	<input type="text"/>	
	R.TOE	<input type="text"/>	

remain 78 DOG LLS

close

4. When you find "Ok" On the top left corner, means finish calculate. Enter **close** to exit.

ok

F.L.Camber	0.0000	F.L.Camber	0.0000
R.L.Camber	-2.02144504	R.R.Camber	25.25499725
			0.0000
			4.20790297

remain 77 DOG

close

EBDB

ok

OK

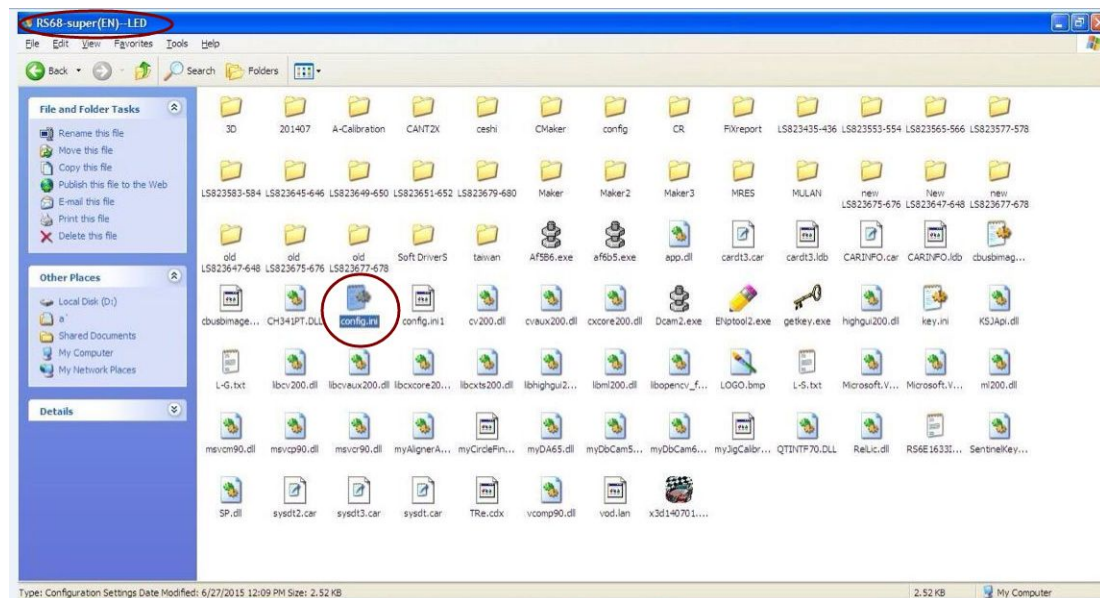
remain 77 DOG

remain 77 DOG

means still can make calibration 77 times.

5. In B-calculate file, check the calibration time in the config.ini. For example, if you find the calibration time **initdate=2015/6/25 18:35:25**, calculate finished.

6. Then copy the final **config.ini** to the original software package folder. All is finished.



END