



Imaging Luminance Colorimeter

KS Series

Software User's Manual

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Leader in Lighting & Electrical Test Instruments

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1. Abstract

1.1. Before set up

PROICM is the standard software of ?G-Series Imaging Colorimeter, mainly used in display luminance and chromaticity analysis.

Package

- Key (USB –Dog)
- Manual

Software license agreement

The license agreement terms for the software dialog box will be displayed on the screen during the installation. You may install the Software only if you agree to the terms of this Agreement.

Attention

- Software Based on Windows 7、 Windows 8 、 Windows 10 32or64bit system. Noted that the operating system is not included in the software.
- One of the operating systems mentioned above must be installed on the computer before setting up the software.

Ensure that the software is operated correctly. If you have any questions or comments, please contact distributor or manufacturer.

1.2.System requirement

Windows 7 (64bit)

Windows 8 (64bit)

Windows 10 (64bit)

Computer with equivalent to CORE i5 or higher performance processor

Storage 4G (recommend 8G or more)

Hardware Driver 1GB available hard disk space

At least 1GB of hard disk free space is required on the system driver (the driver of the operating system).

Display 1280 x 1024 pixel/16 bit or better display hardware

USB key

USB 3.0 connect to instrument

Systems

Windows 7:MicrosoftWindows7 64bit operating systems

Windows 8:MicrosoftWindows7 64bit operating systems

Windows 10:MicrosoftWindows7 64bit operating systems

TM

- "Microsoft", "Windows", "Windows 7", "Windows 8" and "Windows 10" are the trade mark of Microsoft.
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Other company and product names mentioned in this manual are from registered trademarks or trademarks of their respective companies.

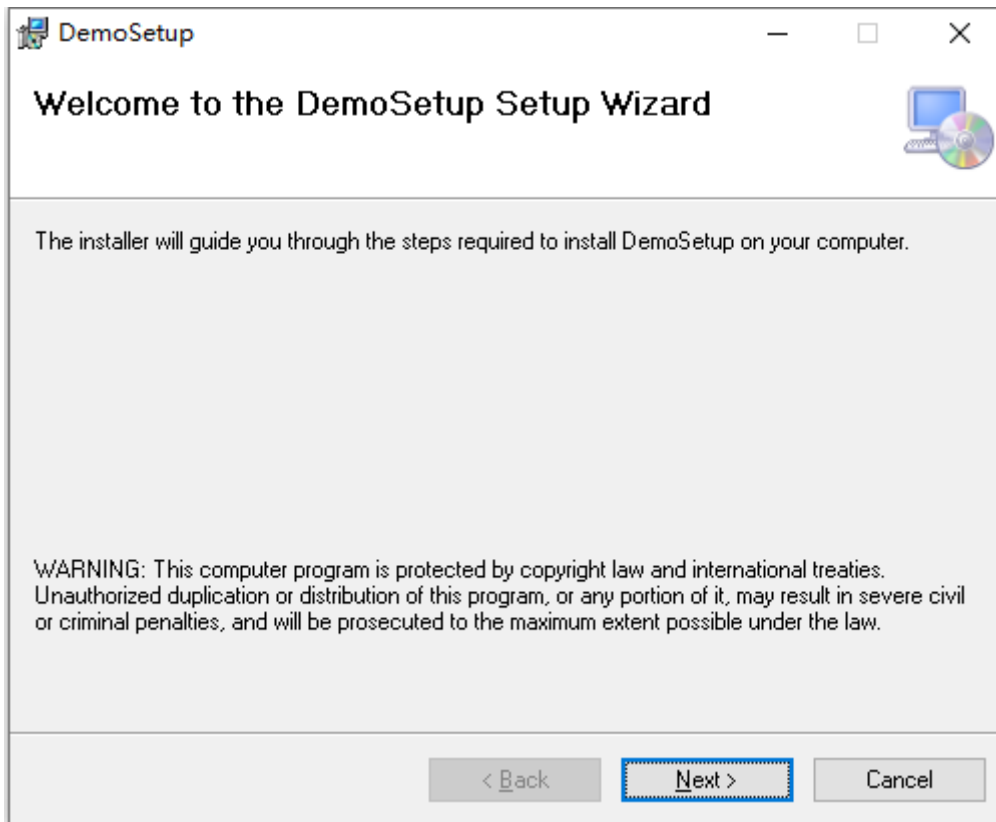
Notice

- This manual may not be reproduced in any ways without permission.
- The contents of this manual are subject to change without notice.
- We have tried to ensure the accuracy of the contents of this manual. Please contact us if you have any questions or comments, or find errors or omissions.
- The company is not responsible for the consequences of not following the instructions mentioned in this manual.

2.Set up

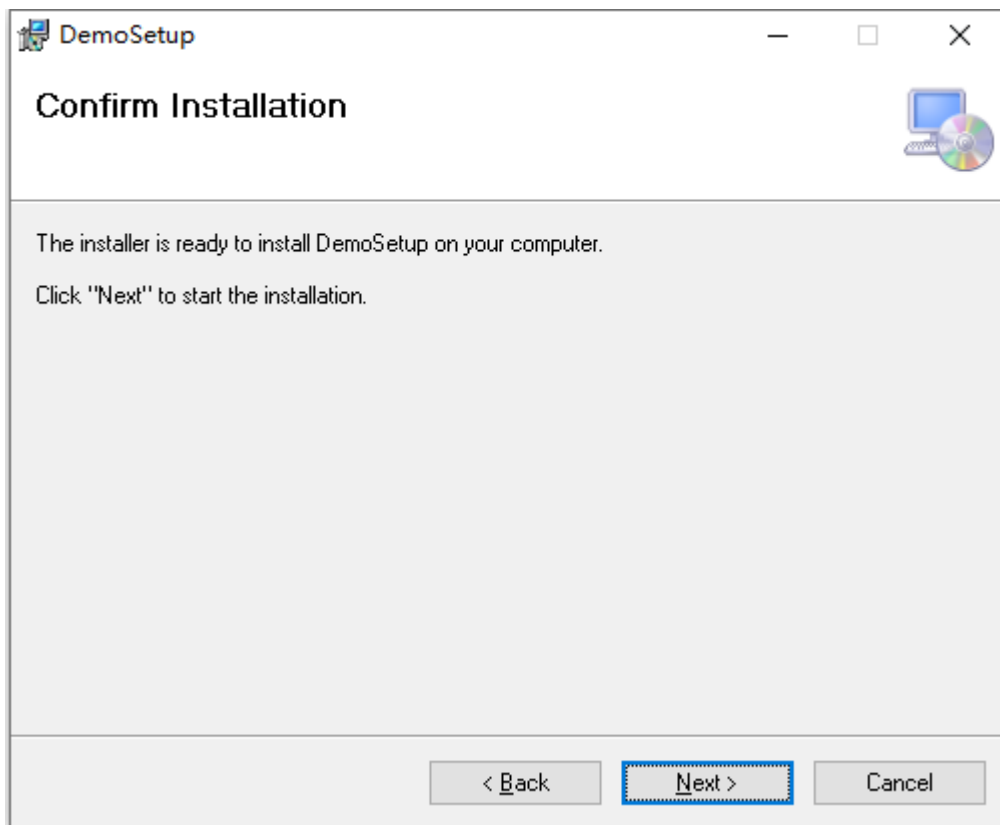
2.1.Software set up

Insert the software USB flash disk, open the USB flash disk and double-click "setup.exe" to start the installation program.

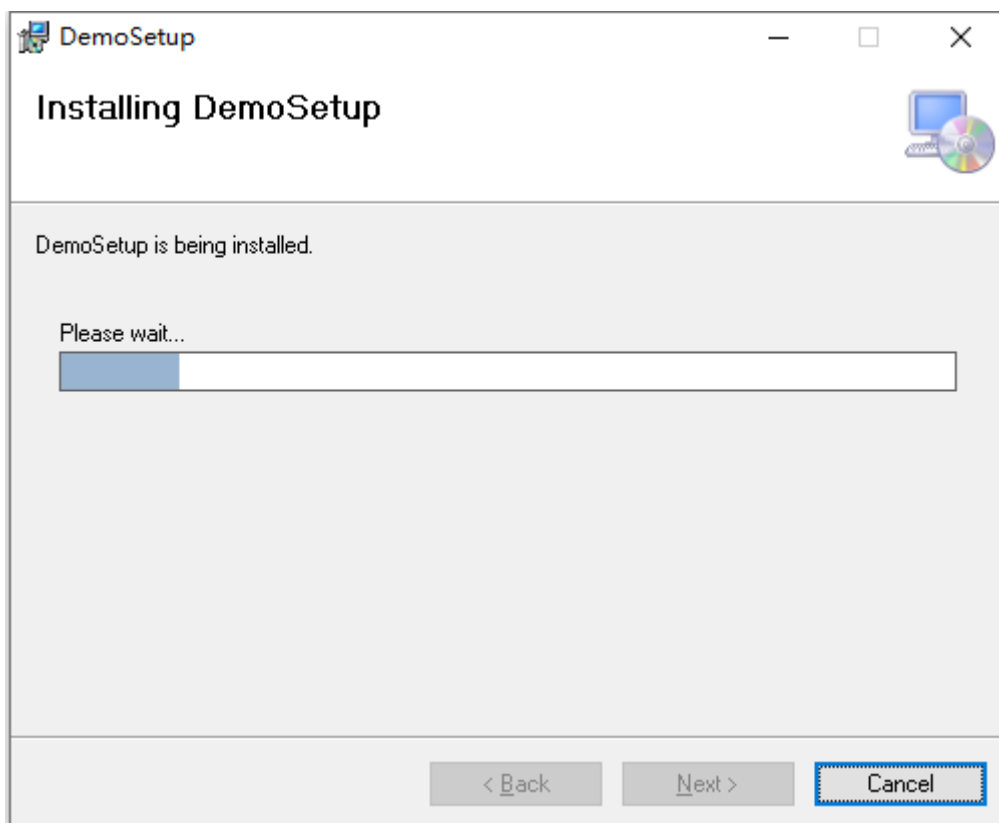


Click "Next"

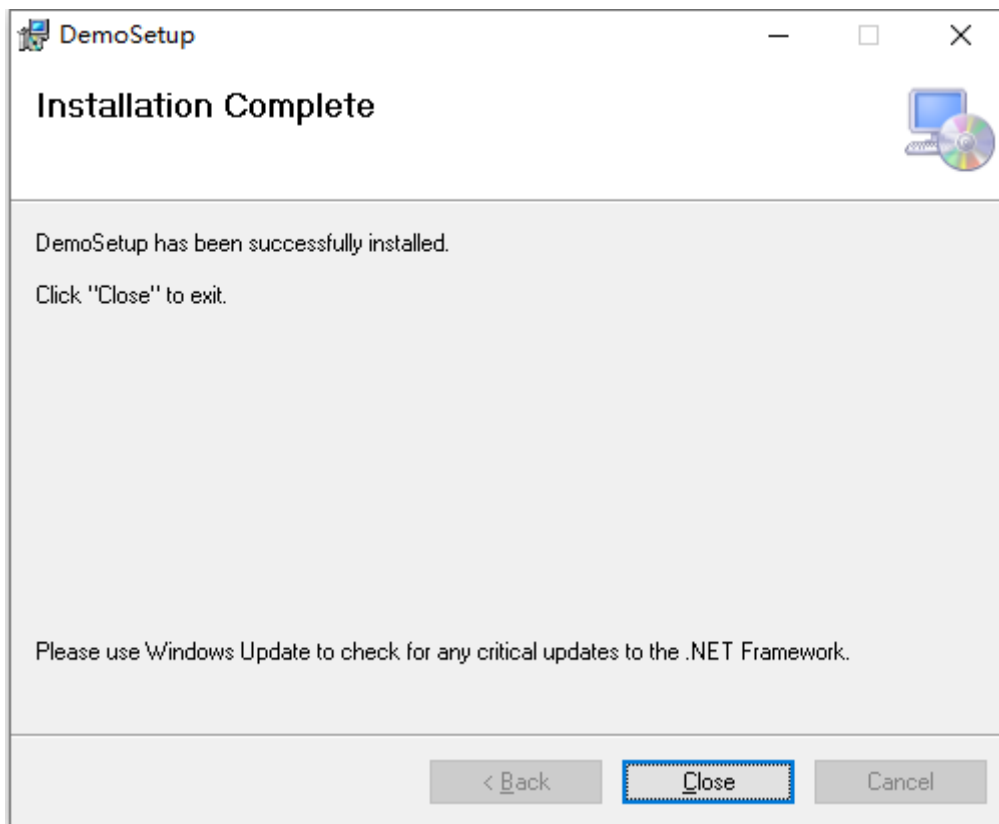
Select software set up file, click “Next”



Set up or not? Click “Next”



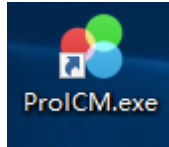
Program is being installed...



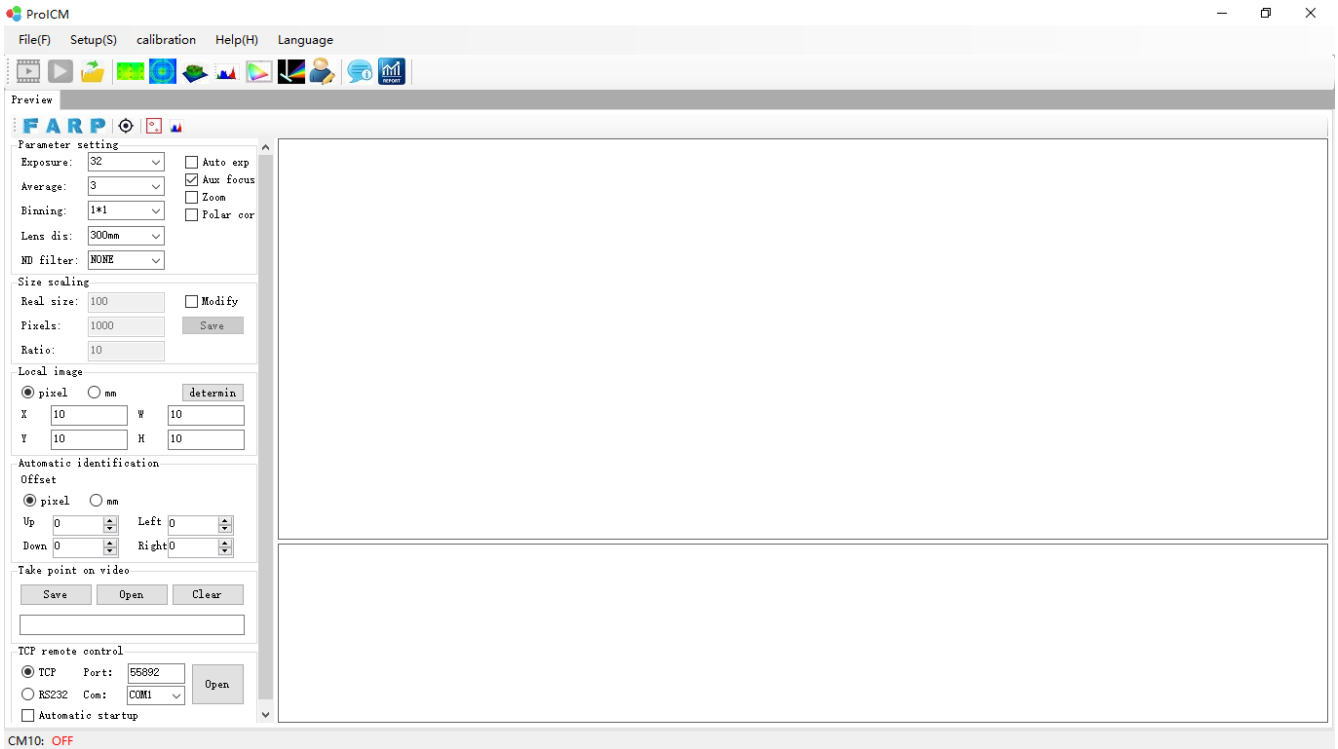
installation finish, click the "Close" to exit

3. Instructions

Double-click the desktop program icon,



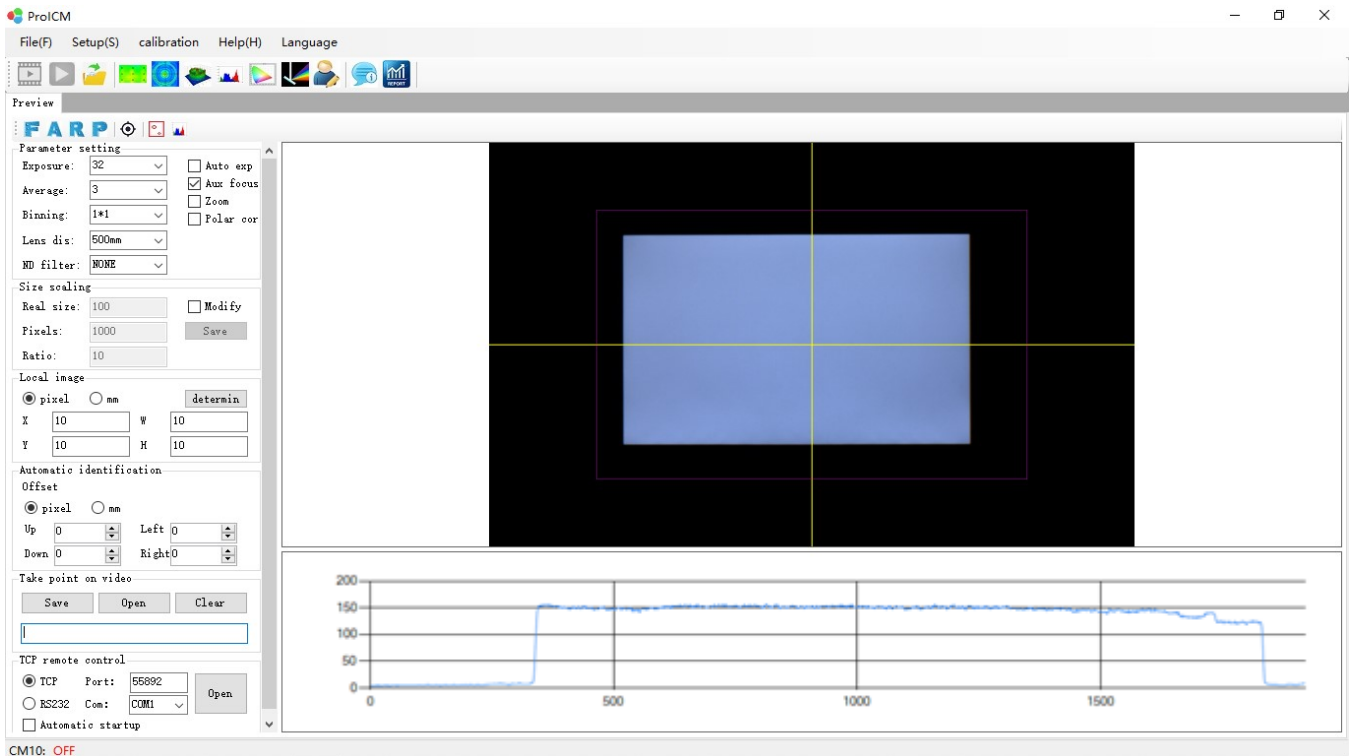
enter test interface.



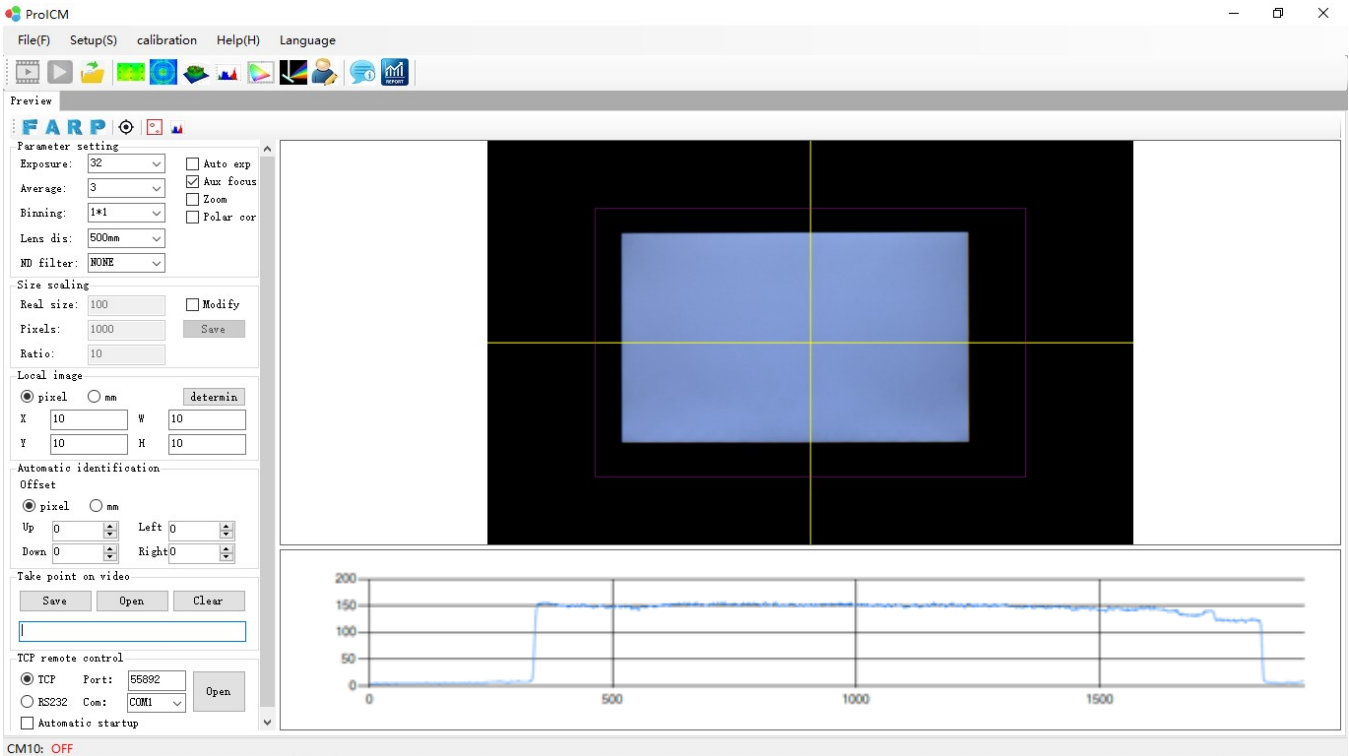
3.1. Preview



Click the button to enter video mode

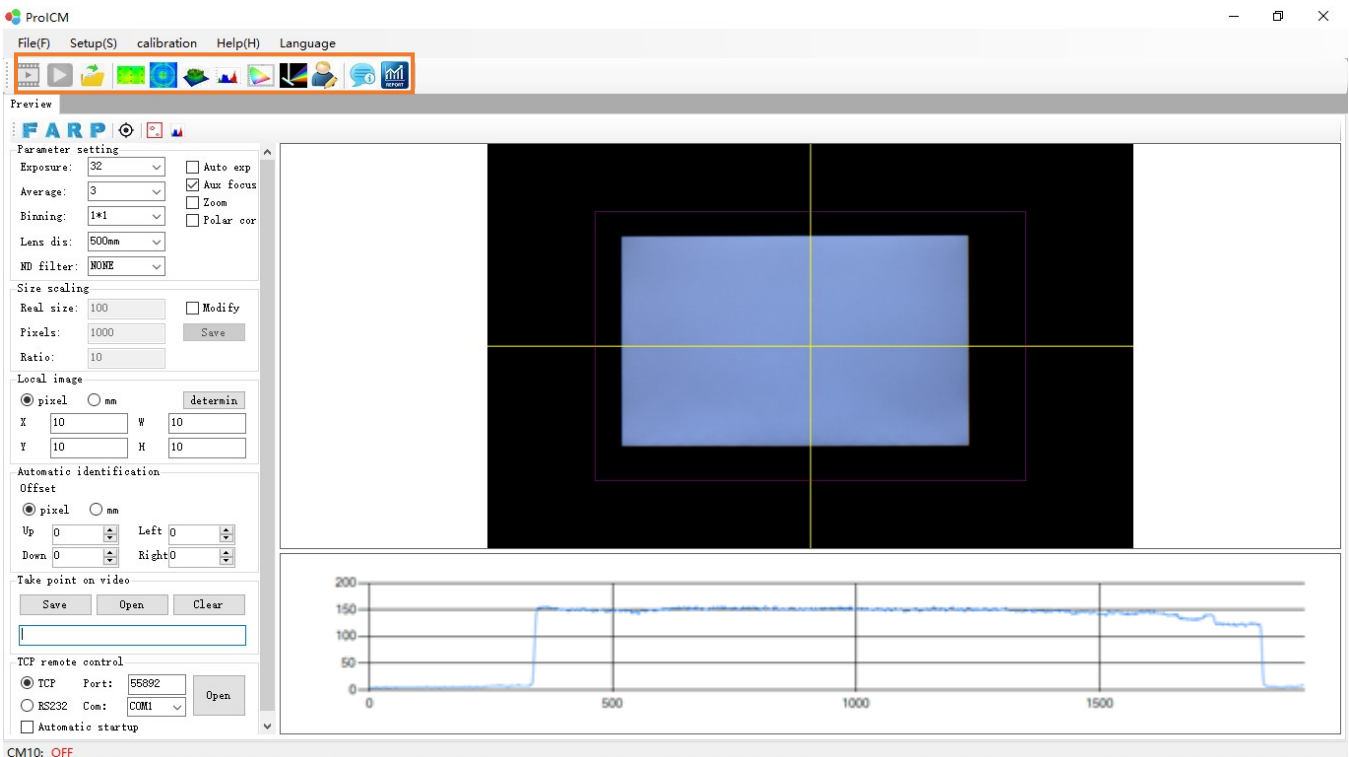


In the "Exposure Time" menu bar, select the appropriate gear to adjust exposure time, also can choose "Auto Exposure" to automatically select the correct time.

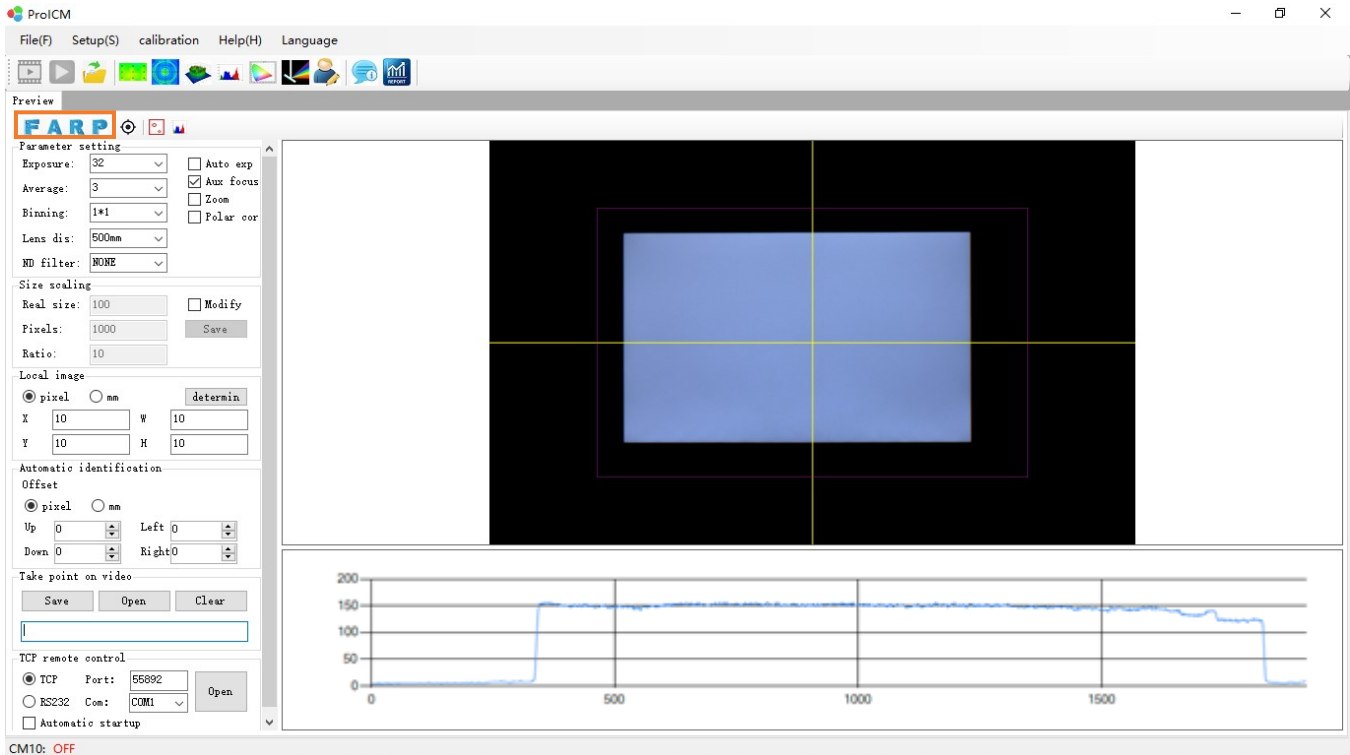



Note: Automatically identifying the light-emitting area and obtaining accurate data, correct exposure time is a must. Refer to the peak image below the video image. The peak value between 150-200 is the appropriate exposure time.

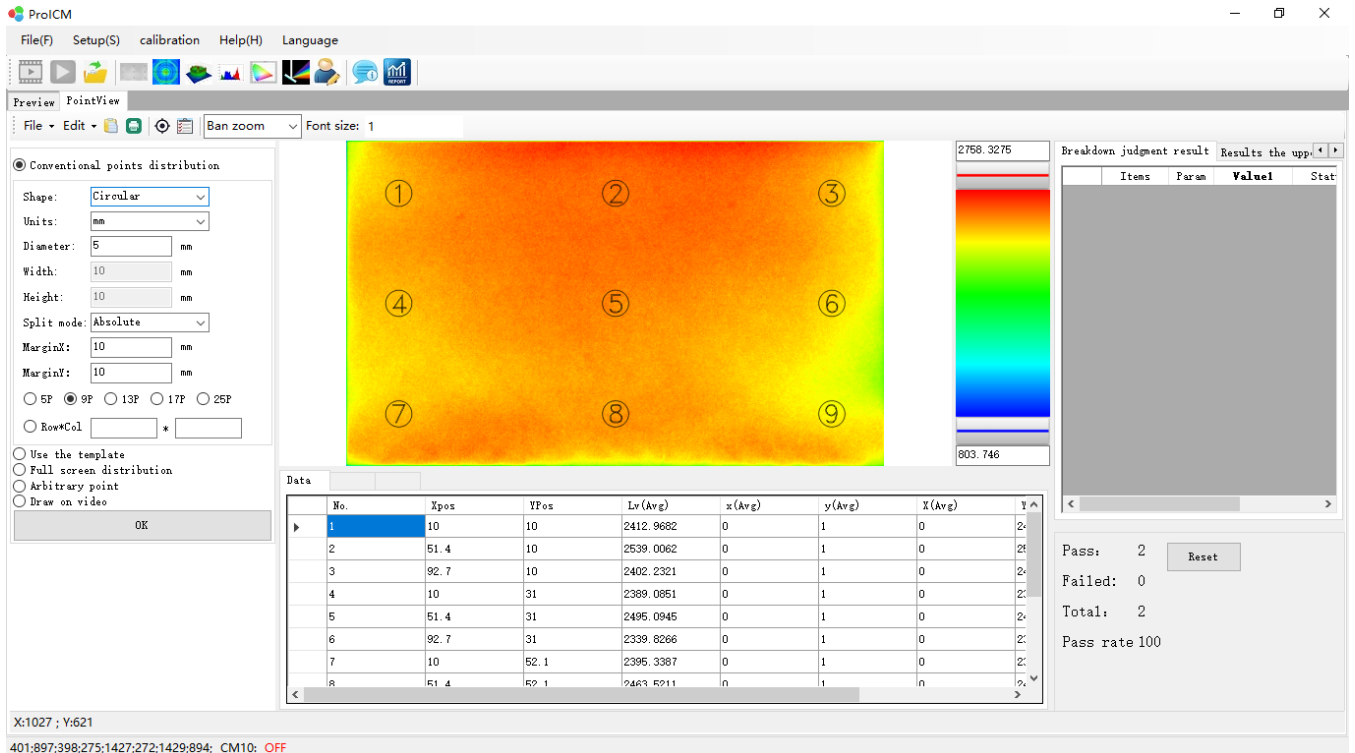
According to the test requirements, open the test modules in the function module bar, such as "point view" and "2D view".



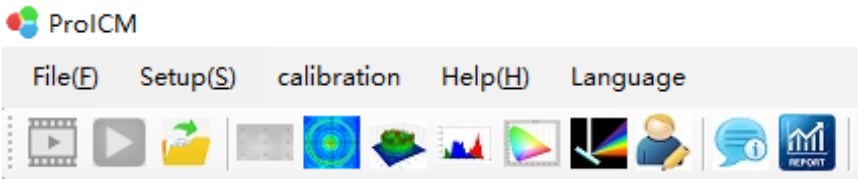
Select proper recognition tool to obtain the test area, "F" for full frame, "A" for automatic recognition of a single smallest rectangle, "R" for manual rectangle, "P" for manual quadrilateral.



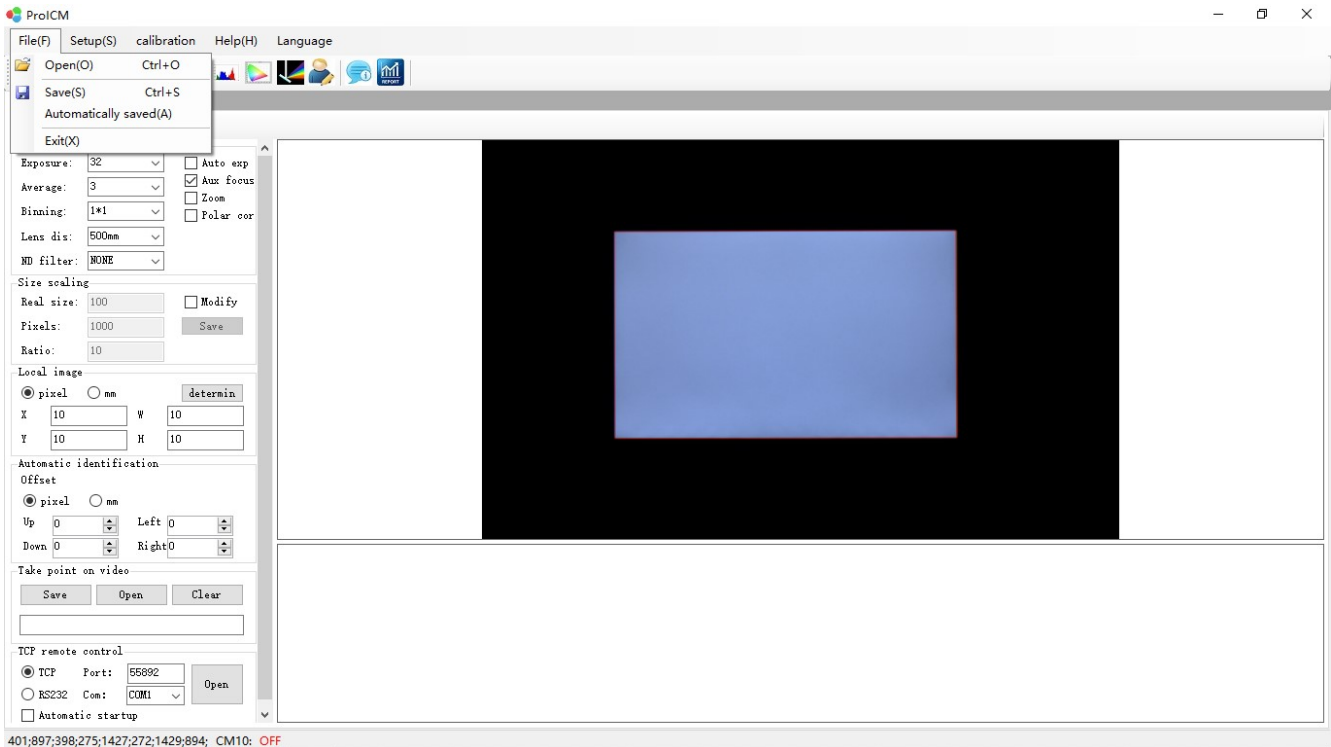
Click  to complete the measurement, select the corresponding function module for further data analysis and processing, such as point analysis, 2D analysis, data storage, etc.



4.Menu Bar



4.1. File



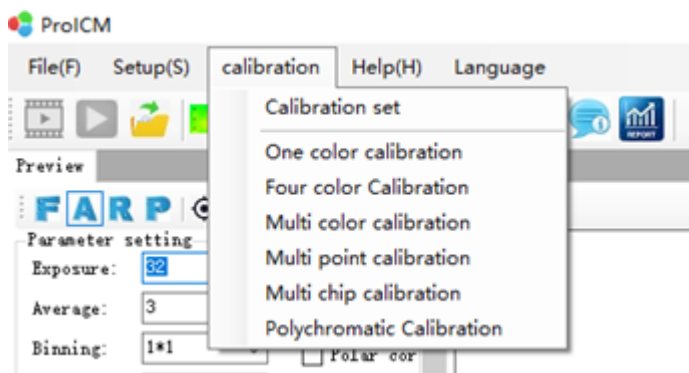
Open: Open a pre-saved image file for offline analysis, which the file format is "image"

Save: Custom path saves the current original analysis data, format is "image"

Auto save: After selection, the image analysis data will be saved in the preset path, the format is "image", and the save path can be changed under the "test information" module.

4.2. Set up

4.3. Calibration

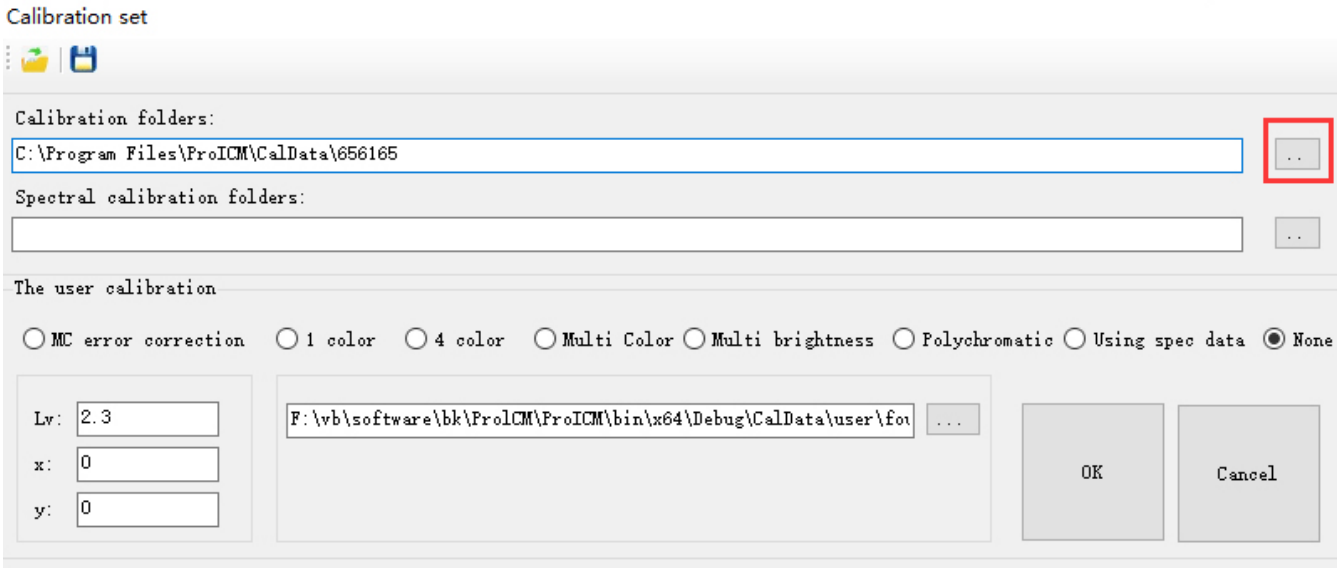


4.3.1. Calibration set up Calibration folder: According to the order to open C:\Program

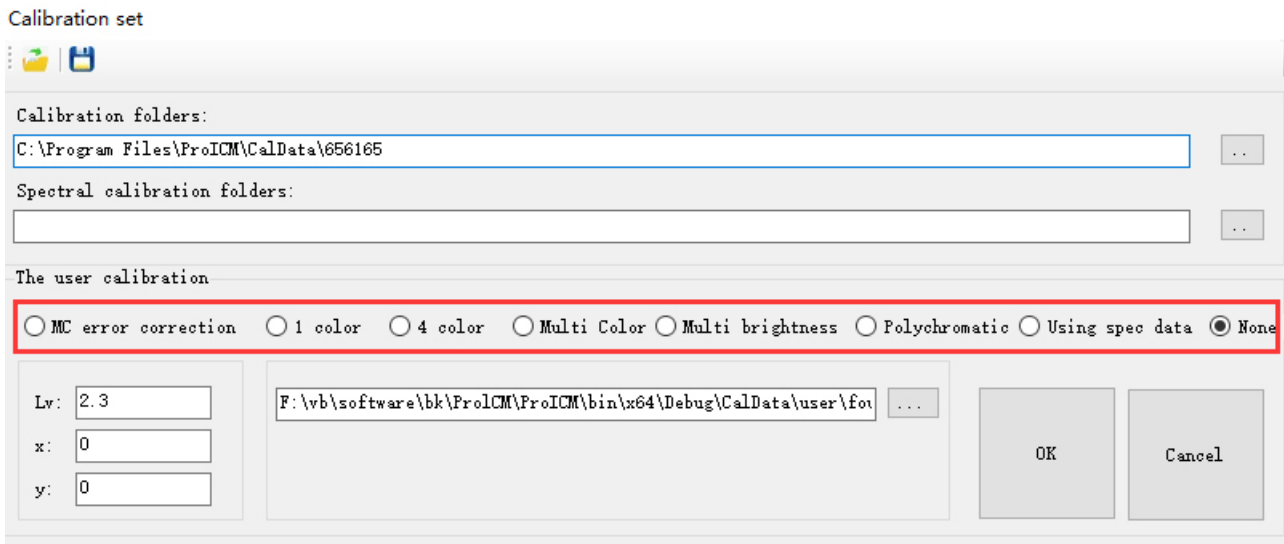
Files\Ray/,681\PROICM\CalDat calibration folder.

Select corresponding lens

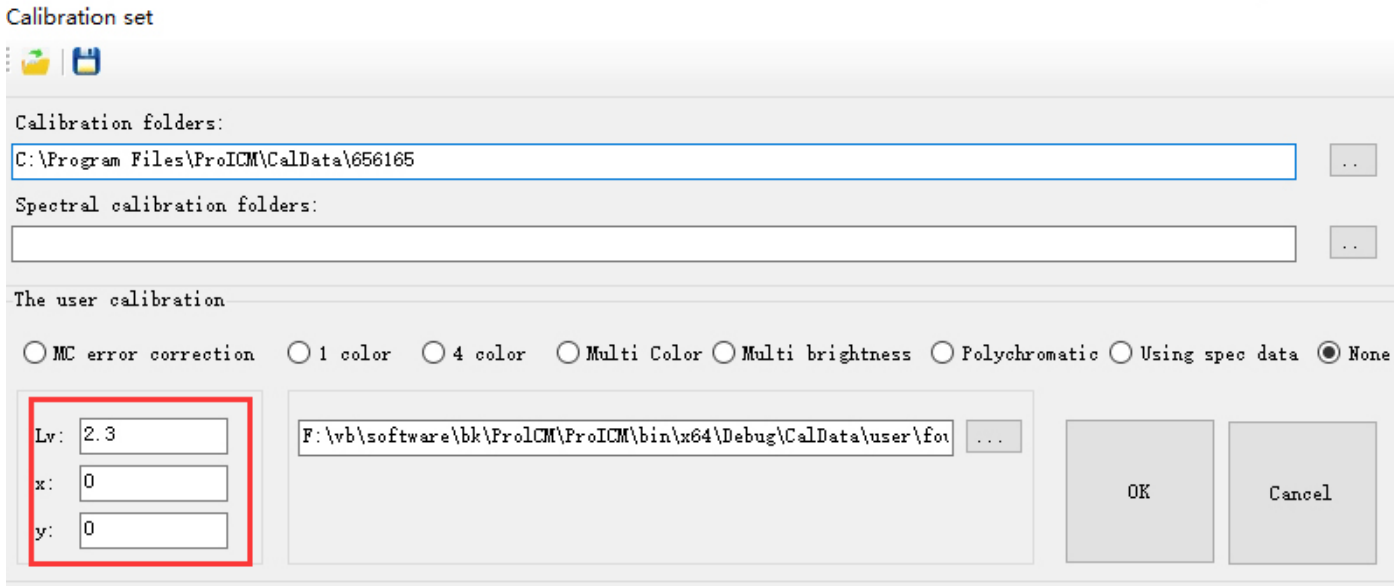
Lens No.




Spectral calibration folder: Selected if it is with spectral module User calibration: Selected according to measurement needs



Machine error correction: If selected the machine error correction, the measured value obtained by Lv is multiplied by 1.52; the x value is added by 0.52; the y value is decreased by 0.15, and the Lv, x, and y values can be freely modified. Single-color calibration, four-color calibration, multi-color calibration, multi-point luminance calibration. If use, select the corresponding calibration file, if not used, check "None".



If selected "Using spec data", the software will use the built-in CM-10 module, so that the measurement data will be calibrated via CM-10 module. Click  the icon of the point view interface to obtain the CM-10 measurement data.



Note: User must strictly follow the calibration setting method! The machine error correction and calibration settings will directly affect the measurement data. If you find that the data deviation is large, please check whether the correction coefficient and calibration settings are correct.

4.3.2. Mono Calibration

1、 Click "Measure" to obtain a sample photo. The product should be lit normally before taking the photo. User calibration choose "None".

2、 Enter the calibration name: Suggest to use product model name (except for Chinese or some special symbols)

3、 Lens distance: Select the same lens distance as preview interface.

4、 Enter or manually select the coordinate position and the diameter of the calibration point : calibrate and set the interface coordinate position in pixels.

X coordinate: The shortest distance from the center of the point to the left edge of the recognition area is 678 pixel units.

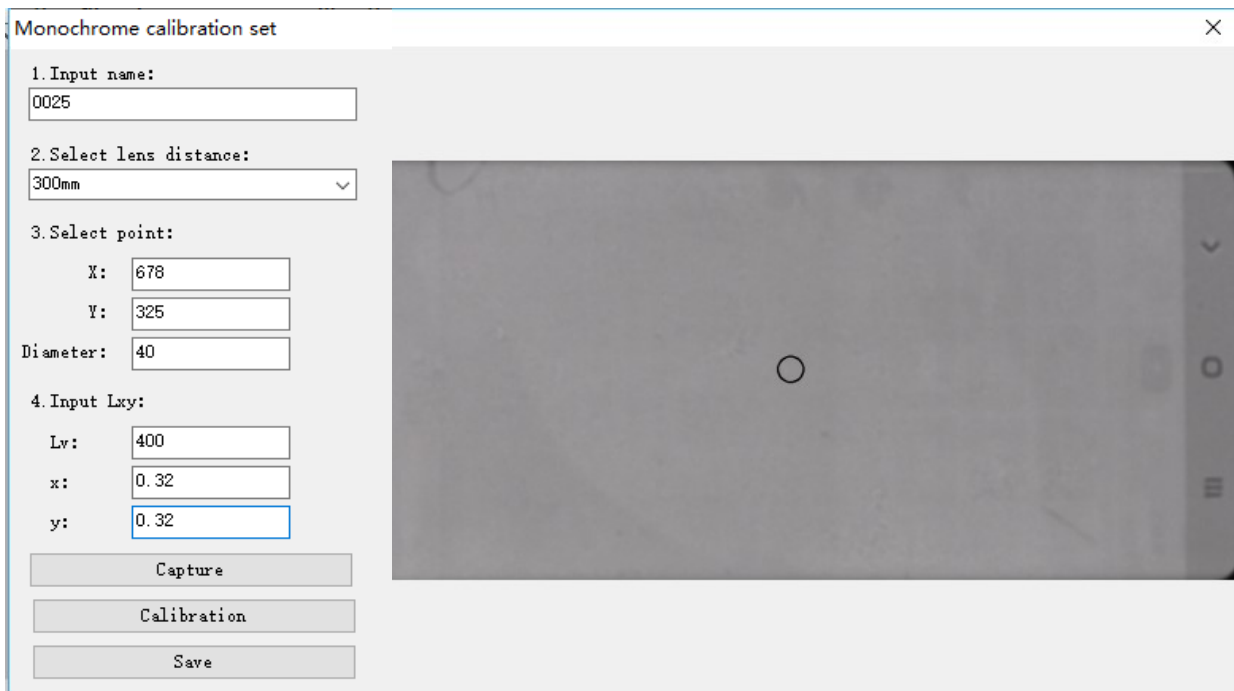
Y coordinate: The shortest distance from the center of the point to the upper edge of the recognition area is 325 pixel units.

Diameter: The diameter of the selected point is 40 pixels as a unit; The conversion ratio between the pixel unit and the distance unit (mm) refers to the "conversion ratio" value in "Preview Interface".

5、 Input luminance value: Enter the Lv, x, y values of the sample measured at the same position in other instruments (such as CS-2000, BM-7).

6、 Click "Calibration"

7、 To select the path and name calibration file (except for Chinese characters) file. After saving successfully, you can select the calibration file when use mono calibration.

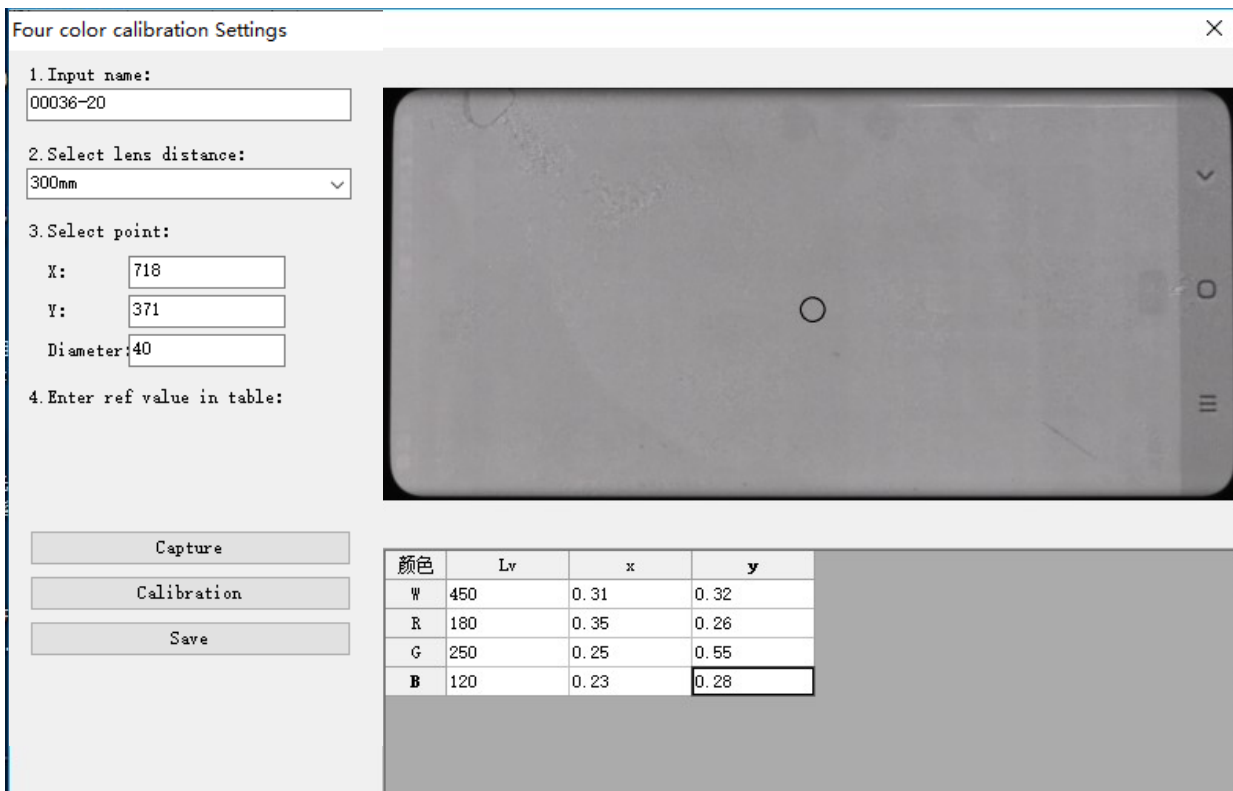


Note: Recommend to make a calibration file for each type of product.

4.3.3. Four color calibration

- 1、Click "Measure" to obtain a sample photo. The product should be lit normally before taking the photo. User calibration choose "None".
- 2、Enter the calibration name: Suggest to use product model name (except for Chinese or some special symbols)
- 3、Lens distance: Select the same lens distance as preview interface.
- 4、Enter or manually select the coordinate position and the diameter of the calibration point : calibrate and set the interface coordinate position in pixels.
X coordinate: The shortest distance from the center of the point to the left edge of the recognition area is 718 pixel units.
Y coordinate: The shortest distance from the center of the point to the upper edge of the recognition area is 371 pixel units.
Diameter: The diameter of the selected point is 40 pixels as a unit; The conversion ratio between the pixel unit and the distance unit (mm) refers to the "conversion ratio" value in "Preview Interface".
- 5、Input luminance value: Enter the sample and measure Lv, x, y values of corresponding WRGB images at the same position on other instruments (such as CS-2000, BM-7).
- 6、Click "Calibration", switch WRGB of the sample in sequence and click "OK".
- 7、To select the path and name calibration file (except for Chinese characters) file. After saving successfully, you can select the calibration file when use four color calibration.

4.3.4. Multi-color calibration



Four color calibration Settings

1. Input name:
00036-20

2. Select lens distance:
300mm

3. Select point:
X: 718
Y: 371
Diameter: 40

4. Enter ref value in table:

Capture

Calibration

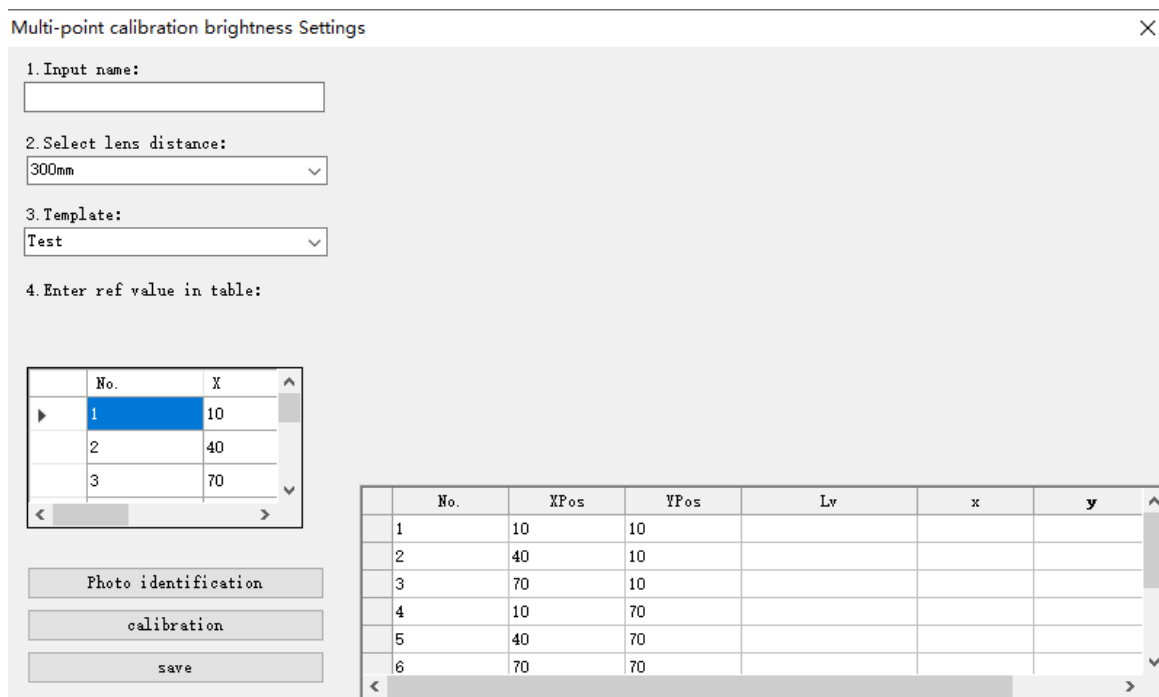
Save

颜色	Lv	x	y
W	450	0.31	0.32
R	180	0.35	0.26
G	250	0.25	0.55
B	120	0.23	0.28

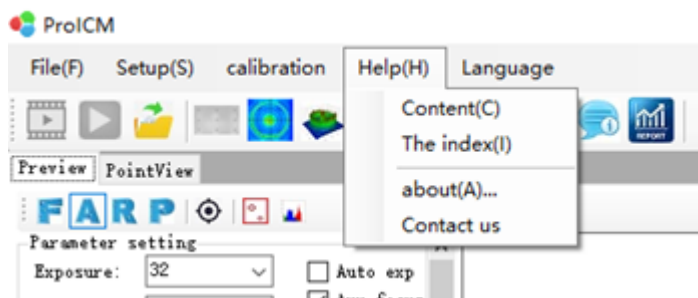
Multi-color calibration setting is similar to the four-color calibration setting.

4.3.5. Multi-point luminance calibration

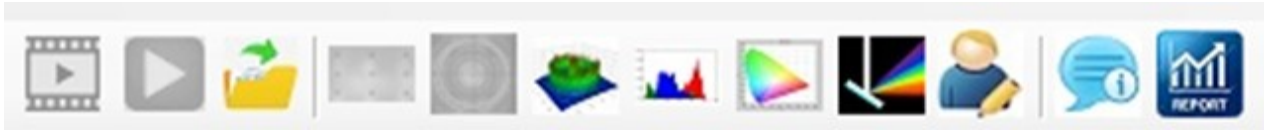
- 1、 Enter the calibration name: Suggest to use product model name (except for Chinese or some special symbols)
- 2、 Lens distance: Select the same lens distance as preview interface.
- 3、 Define measuring points: enter the number of rows, columns and the diameter of the points.
- 4、 Input luminance value: Enter the Lv value of the sample measured at the same position in other instruments (such as CS-2000, BM-7).
- 6、 Click "Calibration"
- 7、 To select the path and name calibration file (except for Chinese characters) file. After saving successfully, you can select the calibration file when use multi-point luminance calibration.



4.4. Help



5. Tool introduction



: Clicking, current camera enters the Preview.



: Clicking, instrument enters measurement mode to capture the current picture for analysis.



: Clicking, you can open the file for data analysis saved before.



: Point view icon, clicking, the picture will enter the point analysis interface.



: 2D view icon, clicking, the picture will enter the 2D view analysis interface.



: 3D view icon, clicking, obtain a 3D view from the picture.



: Histogram icon, clicking, the picture will enter the histogram analysis interface.



: Chromaticity icon, clicking, the picture will enter chromaticity diagram analysis interface.



: Spectrum icon, clicking, the picture will enter spectral analysis interface.



: Customized icon, clicking, you can customize test program

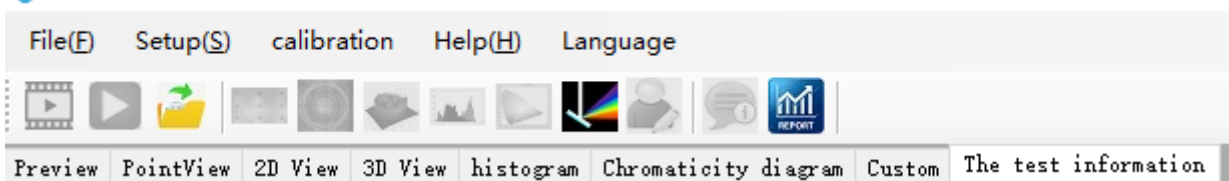


: Test Information icon, clicking, save path of test data can be edited.



: Test report icon, clicking, you can edit the test report information.

ProICM



Note: To select the relevant measurement module firstly, and then return to the preview interface to select measurement mode. After selecting the tool icon, you will enter the function module interface. Double-click the module name to exit current measurement module.




6. Function

6.1. Preview mode introduction

The screenshot shows the FARP software interface with the following sections:

- Parameter setting:** Exposure: 32, Average: 3, Binning: 1*1, Lens dis: 500mm, ND filter: NONE. Checkboxes: Auto exp (unchecked), Aux focus (checked), Zoom (unchecked), Polar cor (unchecked).
- Size scaling:** Real size: 134, Pixels: 1088, Ratio: 8.119. Checkboxes: Modify (unchecked). Button: Save.
- Local image:** Radio buttons: pixel (selected), mm. Button: determin. Input fields: X: 10, W: 10, Y: 10, H: 10.
- Automatic identification:** Radio buttons: pixel (selected), mm. Input fields: Up: 0, Left: 0, Down: 0, Right: 0.
- Take point on video:** Buttons: Save, Open, Clear. Input field: (empty).
- TCP remote control:** Radio buttons: TCP (selected), RS232. Port: 55892, Com: COM1. Button: Open. Checkboxes: Automatic startup (unchecked).

Preview mode measurement function

- F** : Full frame
- A** : Automatic recognition of a single smallest rectangle
- R** : Manual rectangle, obtain rectangle by mouse
- P** : Manual quadrilateral
-  : Mouse detector
-  : Tool under video mode
-  : CM-10 Module

Parameter setting

Exposure time: select appropriate exposure time according to the current picture quality

Average times: exposure times (1-5)

Binning: Pixel merge

Lens distance: actual distance between the lens product

ND filters: optional

Size calibration

Need to re-calibrated when the height is changed from the lens to surface of the object, enter the actual size (mm) of a selection area, and enter the actual number of pixels in the area. The actual number can be obtained by the mouse detector in the 2D view and the software will automatically obtain the conversion ratio after saving change.

For example: "conversion ratio: 8.119" means there are 8.119 pixels in 1mm

Partial image

Determine X, Y, W, H values to obtain an ROI area

Shift

Can set up, down, left and right side shift

Get point in video mode

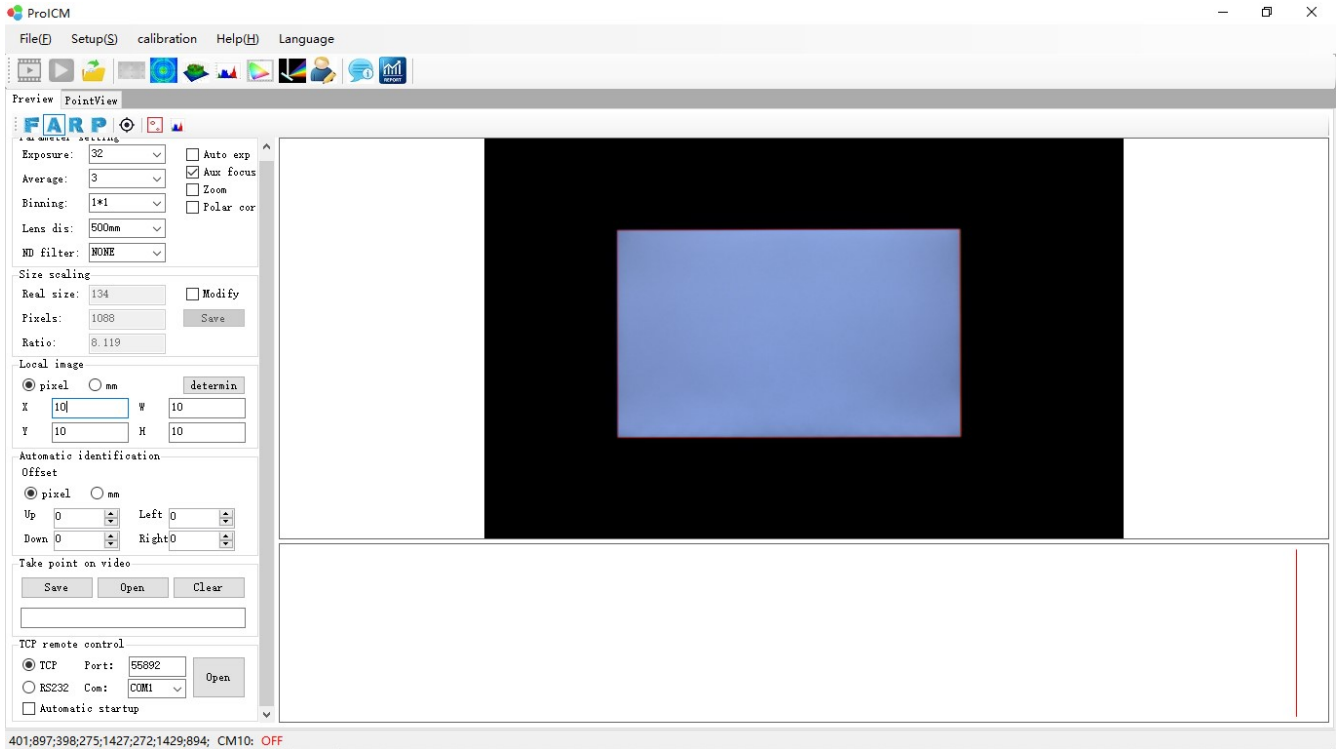
Use selection tool under video mode

TCP remote control

Connect with automation equipment

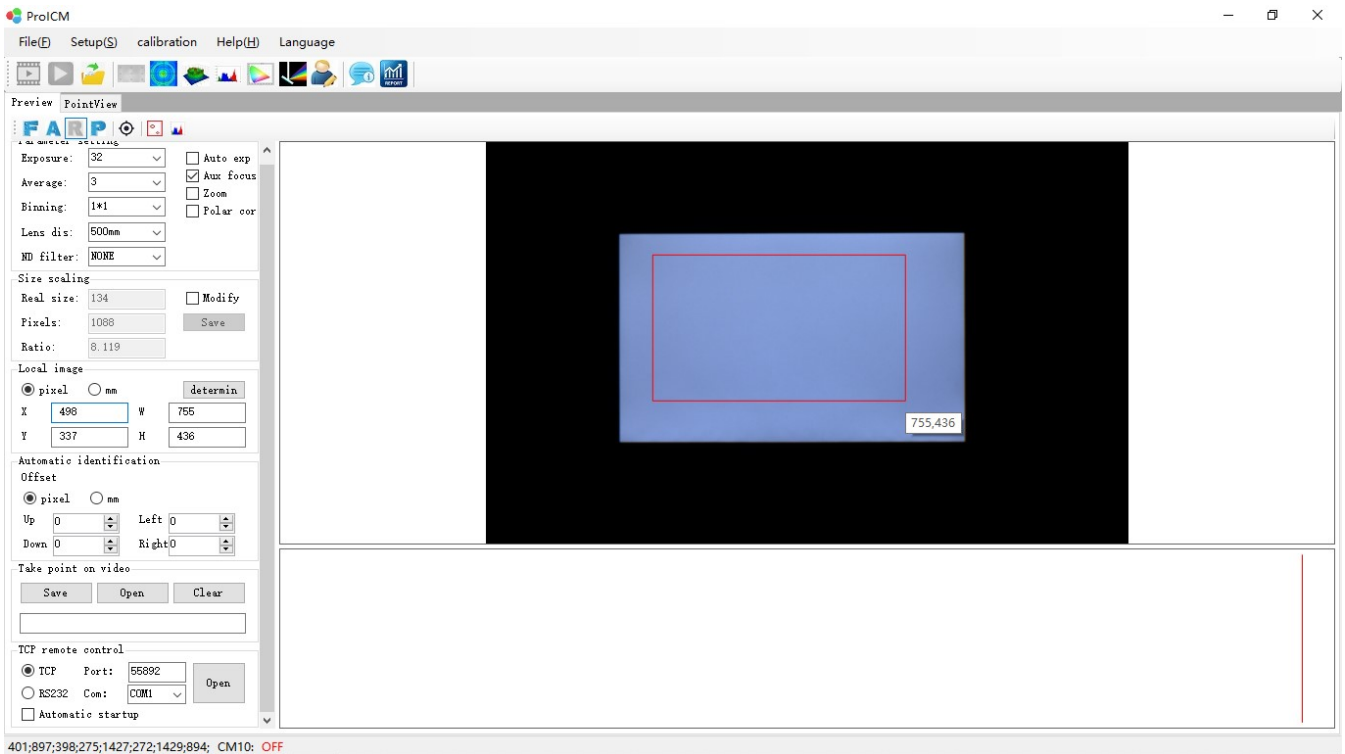
6.1. 1. Automatic recognition measurement

Mainly use "A" to automatically obtain a light-emitting area, suitable for products with high ambient light contrast such as backlight module testing. Check exposure time and light-emitting area if it cannot be recognized.



6.1. 2. Manual rectangle measurement

Use mouse to obtain a rectangular area.



6.2. Point Analysis Function

Conventional points distribution

Shape: Circular
 Units: mm
 Diameter: 5 mm
 Width: 10 mm
 Height: 10 mm
 Split mode: Absolute
 MarginX: 10 mm
 MarginY: 10 mm
 5P 9P 13P 17P 25P
 Row*Col
 Use the template
 Full screen distribution
 Arbitrary point
 Draw on video
 OK

No.	Xpos	YPos	Lv(Avg)	x(Avg)	y(Avg)	I(Avg)	I
1	9.9766	9.9766	2485.3768	0	1	0	2
2	46.5575	9.9766	2547.0416	0	1	0	2
3	83.0151	9.9766	2526.0736	0	1	0	2
4	9.9766	26.8506	2443.3112	0	1	0	2
5	46.5575	26.8506	2520.261	0	1	0	2
6	83.0151	26.8506	2448.6207	0	1	0	2
7	9.9766	43.7246	2372.496	0	1	0	2
8	46.5575	43.7246	2470.4094	0	1	0	2

Items	Param	Min
1	Avg	
2	Min	
3	Max	
4	Avg	
5	Min	
6	Max	
7	Avg	
8	Min	
9	Max	
10	Avg	
11	Min	
12	Max	
13	Avg	
14	Min	
15	Max	
16	Avg	
17	Min	
CCT	Min	

Pass: 7
 Failed: 0
 Total: 7
 Pass rate 100

X:755 ; Y:436
 401;897;398;275;1427;272;1429;894; CM10: OFF

6.2.1. Point view menu bar



: Copy current image

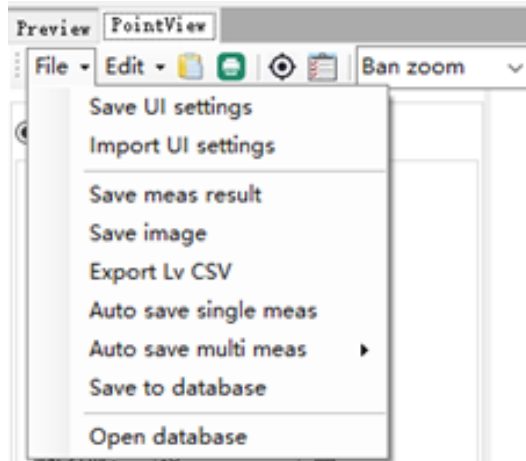
: Print preview

: Mouse detector, after clicking, the mouse can display the data of the current pixel of the picture, click again to cancel the function.

: Hide and show the "Result Judgment List" on the right side of the image

Ban zoom : To select whether allow zooming

6.2.1.1. File



Save interface settings: save all current settings of the point view module.

Import interface settings: import the settings of the pre-stored point view module.

Save measurement result: save the result of the current point view data list and the save path can be selected (format: .xls).

Save image: save the current point view point distribution image (format: .jpg)

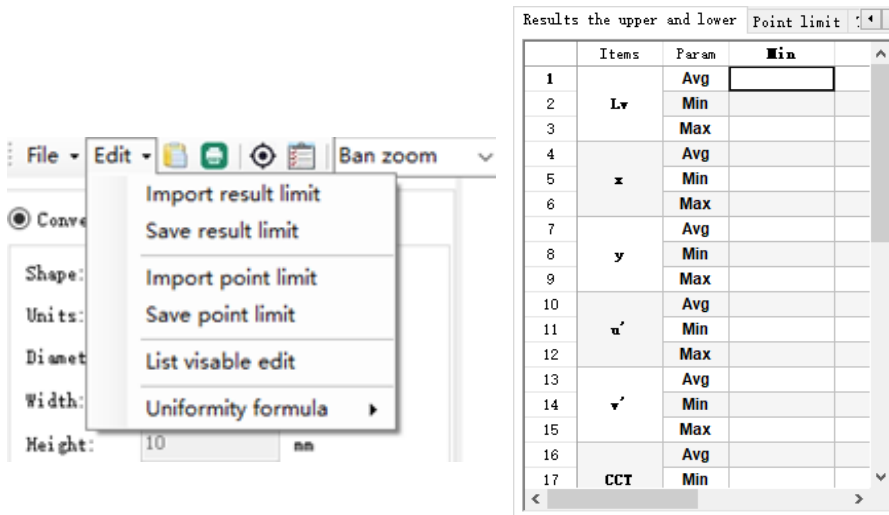
Automatically save single measurement results: automatically saved current data, and the save path can be preset in "Test Information".

Automatically save multiple measurement results: automatically saved current data, and the save path can be preset in "Test Information".

Save to database: clicking, the measurement results are saved in the database.

Open the database: view the history data and the report format can be preset in the "test information".

6.2.1.2. Edit



Import upper and lower limit of results settings: Import the settings in the pre-saved upper and lower limit of results list.

Save upper and lower limit of results settings: Save the settings in the current upper and lower limit of results list and the save path can be selected.

Import upper and lower limit of the point settings: Import preset upper and lower limit of the point settings.

Save upper and lower limit the point settings: Save the settings in the current upper and lower limit of the point list and the save path can be selected.

Data list visible editing: Hide or display the data items in the data list.

6.2.2. Point view interface function introduction

Conventional points distribution

Shape:

Units:

Diameter: mm

Width: mm

Height: mm

Split mode:

MarginX: mm

MarginY: mm

5P 9P 13P 17P 25P

Row*Col *

Use the template

Full screen distribution

Arbitrary point

Draw on video

OK

Conventional points distribution

Use the template

Temp1

Temp2

Temp3

Edit

Full screen distribution

Arbitrary point

Draw on video

OK

Conventional points distribution

Use the template

Full screen distribution

TC Grid Edit

Rows: Cols:

Arbitrary point

Draw on video

OK

Regular point

1、The user can set the shape and size of the reference point as required.

2、Users can select 5, 9, 13, 17, 25 point distribution, array distribution, or manually enter the number of rows and columns.

Split mode: absolute value (mm)/percentage (%)

X : the indent distance from the reference point to the left and right side.

Y : the indent distance from the reference point to the up and down side.

Template

Users can use template to edit and save parameters settings as required.

Full screen distribution

Users can select the reference point full-screen distribution measurement mode and customize the number of rows and columns.

Arbitrary point

Users can arbitrarily choose a reference point for measurement and analysis.

Polygon measurement mode

Select multiple points to constitute polygon for measurement and analysis.

Arbitrary point

Polygon mode

FilePath:

Draw on video

Luminescence only

Outline indent(0/200):

6.2.2.1.Regular point distribution

Shape: Round or square.

Unit: Select the unit of the test point, pixels or millimeters

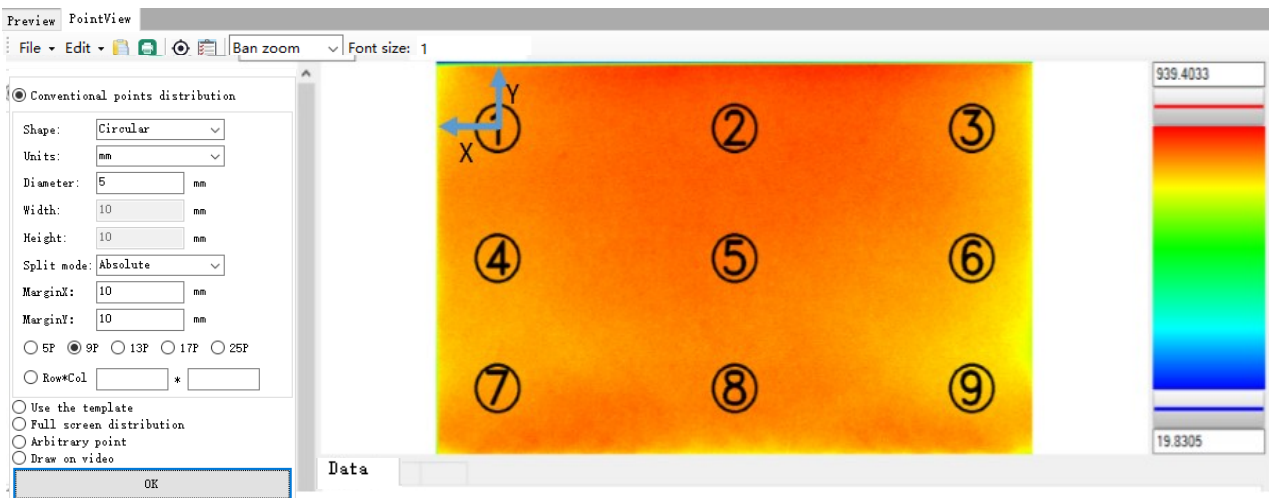
Width: Effective when the shape of the test point is square

Height: Effective when the shape of the test point is square.

Split mode: Absolute value (mm)/percentage (%), as following, X=10mm, Y=10mm, the absolute value positioning, which refers to the distance between the center point of the first point and the sides. Percentage positioning refers to the distance between the center point and the sides as a percentage of the total length and width.

XY distance: Customized input

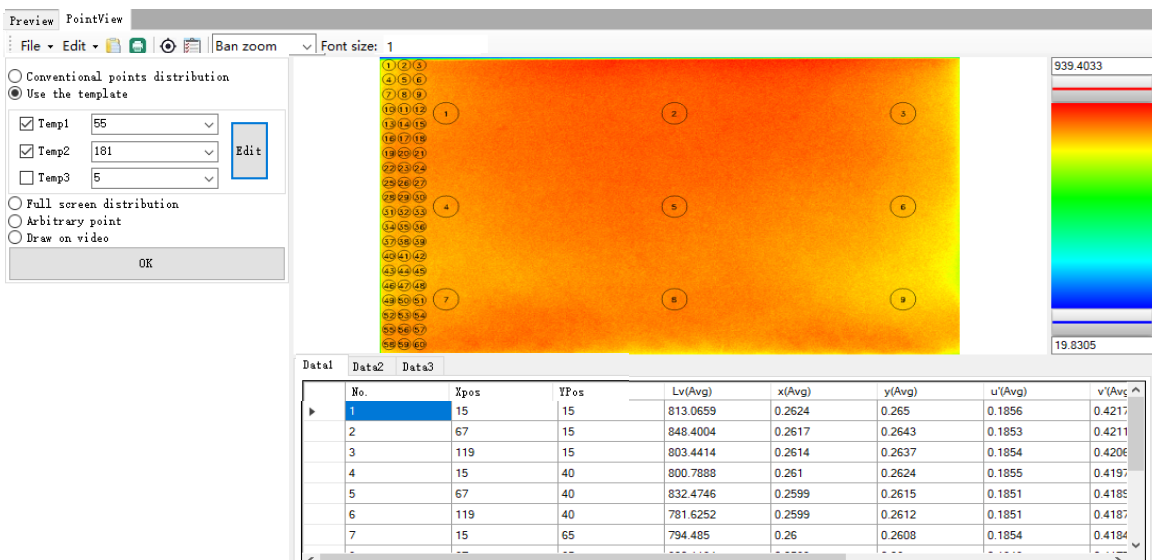
Test point: Also can enter the rows and columns to obtain the measurement points.



Note: After modifying the test point information, the current image can be re-analyzed, and update the data list at the same time. You can also click "Measure" to measure again. You can also use template to customize the test points.

6.2.2.2. Template

You can select multiple template tests at the same time, to select the pre-edited template and measure, and the data of the corresponding template will show in the data list.



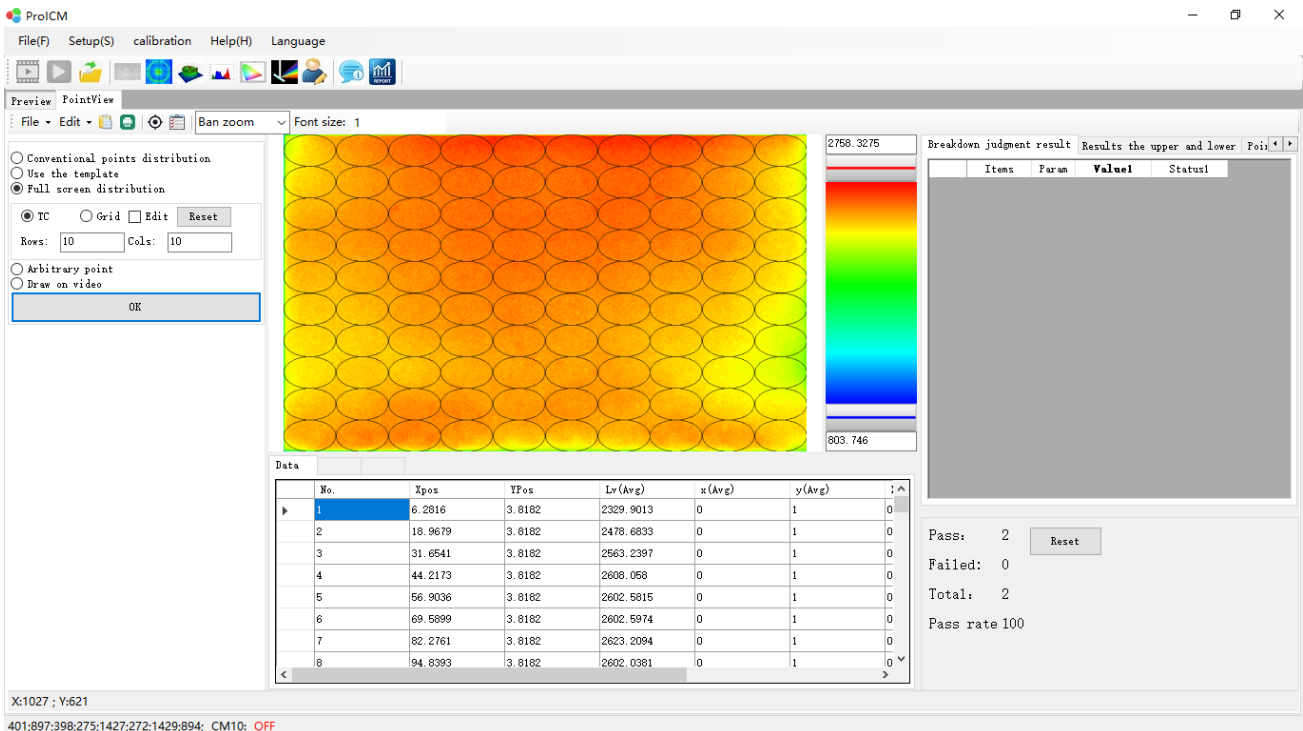
Template editing

1. There are two ways to create a new template, new create or import Txt files, Txt files need to be generated by third-party software, such as CAD.
2. Enter product name
3. Enter width and height of the product, horizontal is the width, and vertical is the height.
4. Enter the radius of the test point
5. Choose the type of distribution. Point distribution, firefly, 13points and 17points. Then, enter the relevant value.
6. Enter the number of rows and columns, as shown in the figure below are nine points in three rows and three columns.
7. Split mode: absolute value (mm)/percentage (%), select type and enter relevant value.
8. Click Save to generate the test distribution template and exit the editing interface.
9. You can select "Edit Template" to modify again.
10. When editing the template, you can delete or add point, click "Refresh" to update the schematic.
11. Click "Save" to re-name test template

PointNo.	Xpos	Ypos
1	5	5
2	66	5
3	127	5
4	5	32.5
5	66	32.5
6	127	32.5
7	5	60
8	66	60
9	127	60

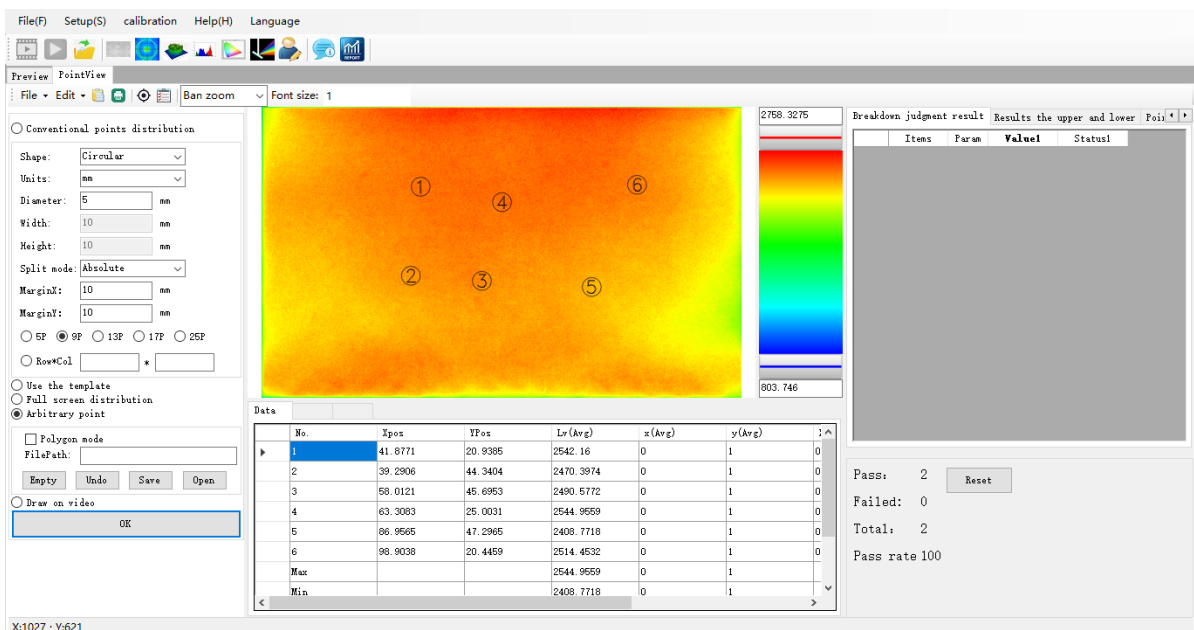
6.2.2.3. Full screen distribution

There are three types of full-screen measurement way, tangent circles, grids and customize array distribution. As following figure shows: tangent circle division of 10 rows and 10 columns. when editing, double-click on the point to cancel the point. There will be no data of the point on the point list. Click "Reposition" to restore to 10 rows and 10 columns.



6.2.2.4. Arbitrary point

Arbitrary point or polygon mode, you can select points or areas on the pseudo color picture. The diameter of the point can be modified in the "Regular point distribution"; Also can save and open test point.



6.2.2.5. Data list



Data							
No.	Xpos	YPos	Lv(Avg)	x(Avg)	y(Avg)	X(A	Y(A
1	42.3697	36.5809	2506.9144	0	1	0	0
2	76.8568	36.5809	2495.1726	0	1	0	0
Max			2506.9144	0	1		
Min			2495.1726	0	1		
Average			2501.0435	0	1		
Difference			11.7418	0	0		
Uniformity			99.532%	NaN	100%		

Serial number: Number of test point

X, Y coordinates: The coordinates of the point

Lv(Avg) : The average value of the luminance of all pixels at this point

Lv(Min) : The minimum luminance of all pixels at this point

Lv(Max) : The maximum luminance of all pixels at this point

x(Avg) : The average value of x of all pixels at this point

x(Min) : The minimum value of x of all pixels at this point

x(Max) : The maximum value of x of all pixels at this point

Max: The maximum value of all points

Min: The minimum value of all points

Average: The average value of all points

Difference: The difference between all points

Uniformity: Uniformity of all points (max/min)

6.2.2.6.Result judgment list

Input the corresponding value to judge the measurement result. Different items will display all results and judgment status. Status list will display OK or NG.

"Upper and lower limits of results" are related to the measurement results, and "Upper and lower limits of points" are related to the test points in the data list.

Results the upper and lower Point limit

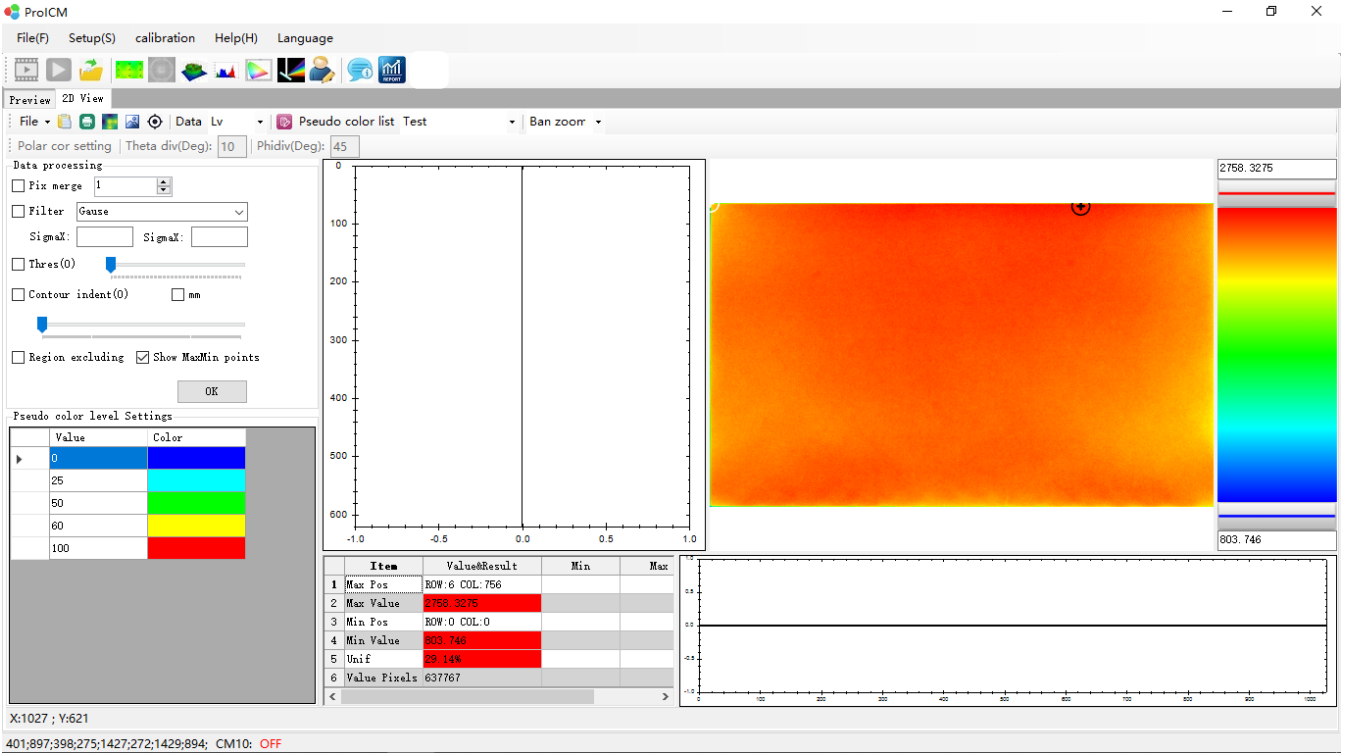
	Min	Max	Select
1	300.0000	500.0000	<input checked="" type="checkbox"/>
2			<input type="checkbox"/>
3			<input type="checkbox"/>
4	0.2500	0.2600	<input checked="" type="checkbox"/>
5			<input type="checkbox"/>
6			<input type="checkbox"/>
7	0.2600	0.2800	<input checked="" type="checkbox"/>
8			<input type="checkbox"/>
9			<input type="checkbox"/>
10			<input type="checkbox"/>
11			<input type="checkbox"/>
12			<input type="checkbox"/>
13			<input type="checkbox"/>
14			<input type="checkbox"/>

Breakdown judgment result Results the upper

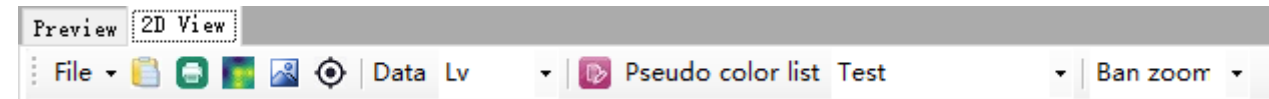
	Items	Param	Value1	Stat
1	Lv	Avg	2410.8302	NG
4	x	Avg	0	NG
7	y	Avg	1	NG

Pass: 0 Reset
 Failed: 0
 Total: 0
 Pass rate 0

6.3. 2D view measurement function introduction



6.3.1. 2D view menu




File: Export or export results, and automatically save results.

 : Copy image

 : Display the contour chart, click again to cancel.

 : Lens analysis

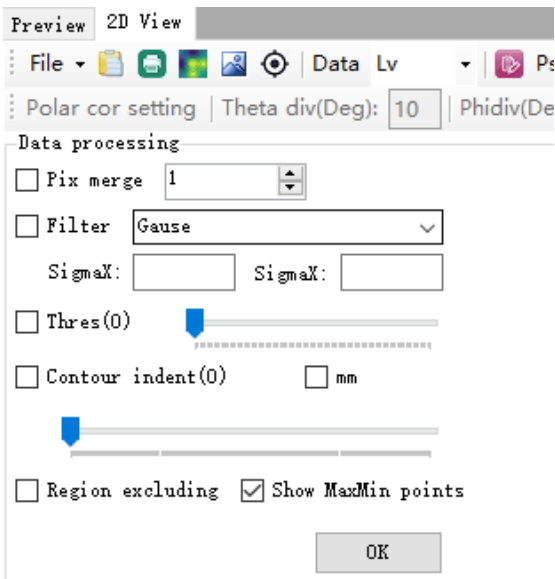
 : Mouse detector, after clicking, the mouse can display the data of the current pixel of the pseudo-color picture, click again to cancel the function.

Data Lv : Optional other data to generate a pseudo color picture, the default is Lv.

Pseudo color list Test : Optional the pre-edited pseudo color level, the default is test.

Ban zoom : To select whether allow zooming

6.3.3. 2D view interface function



Data:

Pixel merging: 1 means not merging pixels, 2 means merging two pixels into one, that is, resolution is doubled, and so on.

Filter: You can select filter to set the Sigma value to obtain better data if pseudo color image has noise interference.

Contour indentation: To obtain the indented area and measure. Reference interface example.

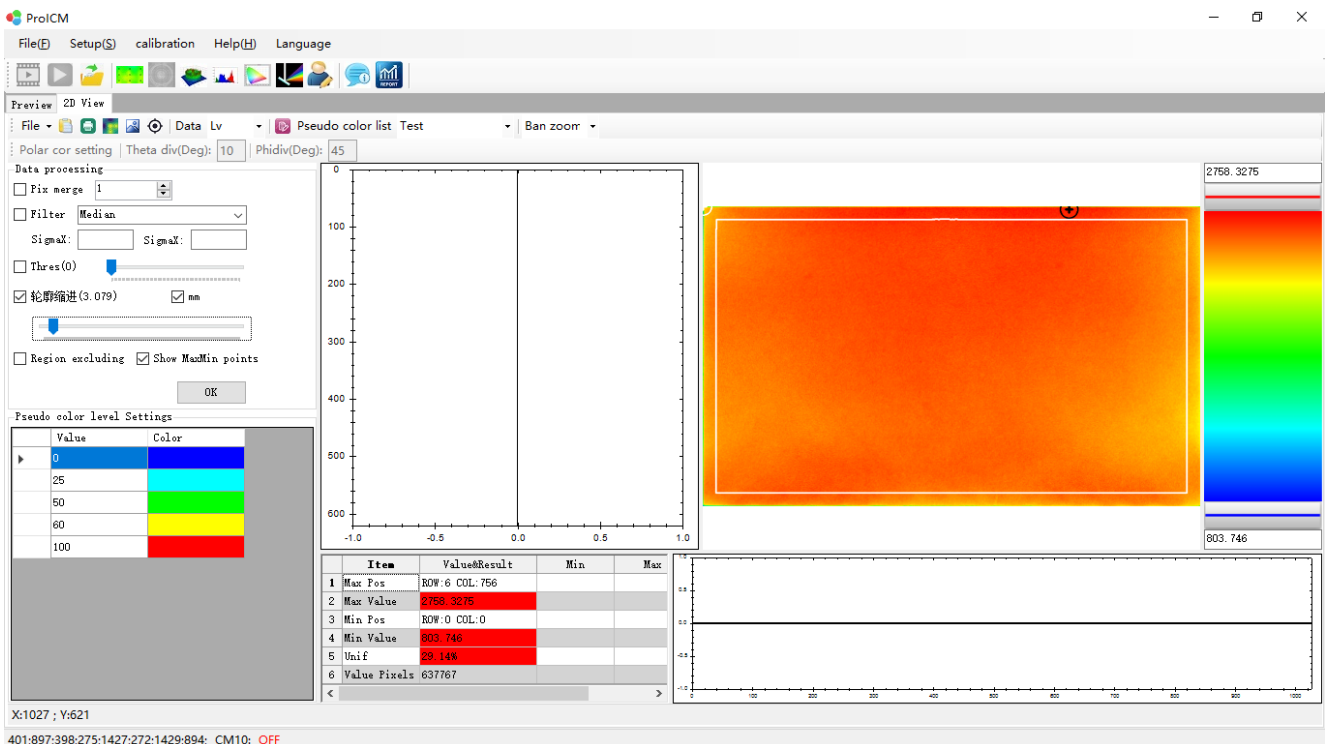
Area removal: To obtain the area to be removed via mouse and the area will not be analyzed.

Maximum coordinate point: The position of the pixel point with the maximum luminance value in the test area

Maximum value: The maximum luminance value in the test area

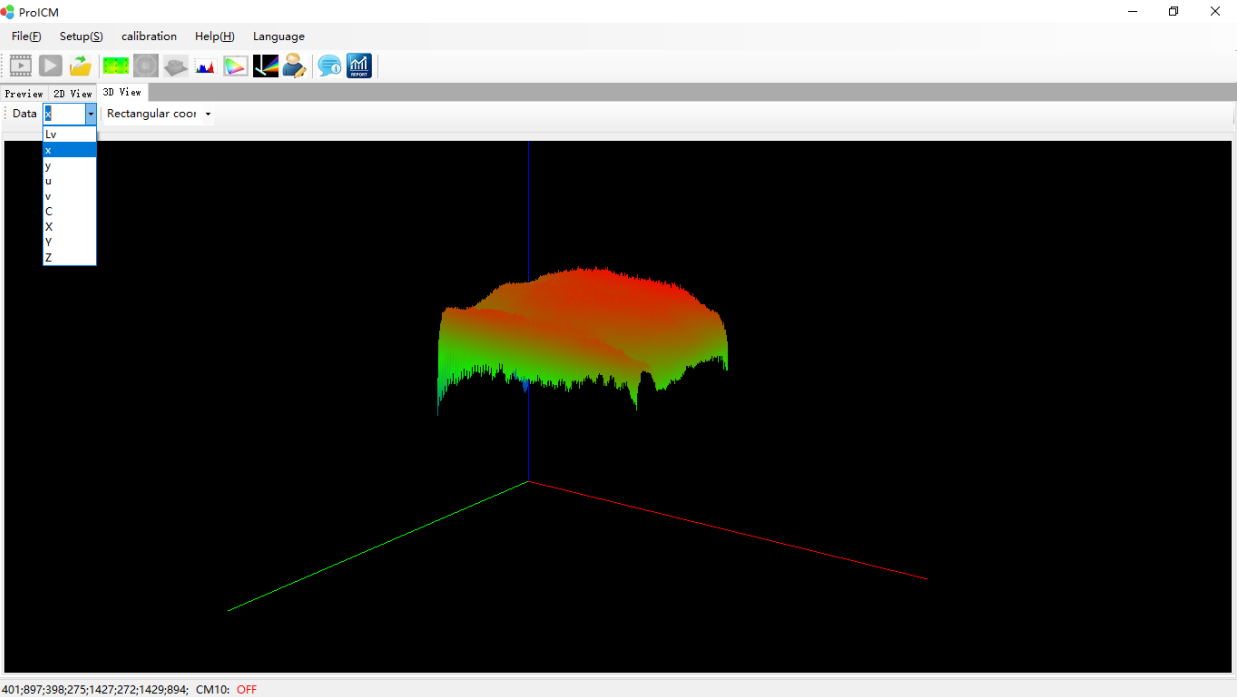
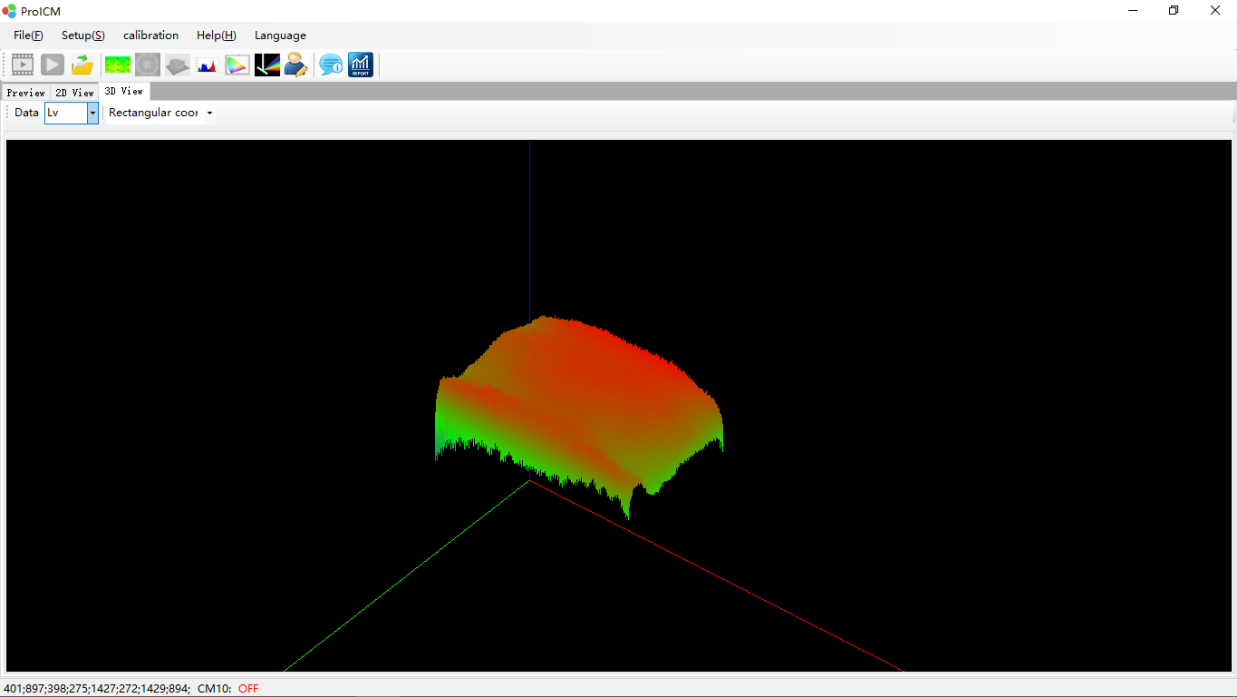
Minimum coordinate point: The position of the pixel point with the minimum luminance value in the test area

Minimum value: The minimum luminance value in the test area



Note: There are many factors that directly affect the uniformity of the product, such as contour indentation, product dead pixels, etc., through data processing tools such as pixel merging, filter, and area removal to obtain more accurate data.

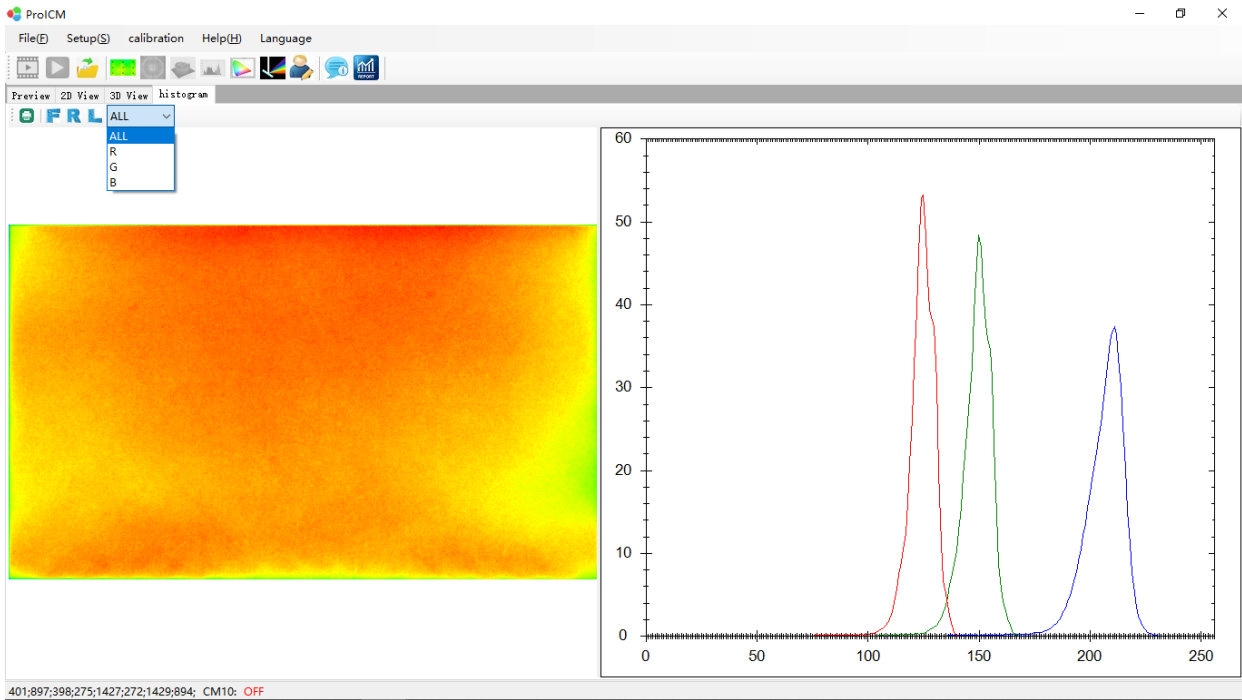
6.4. 3D view



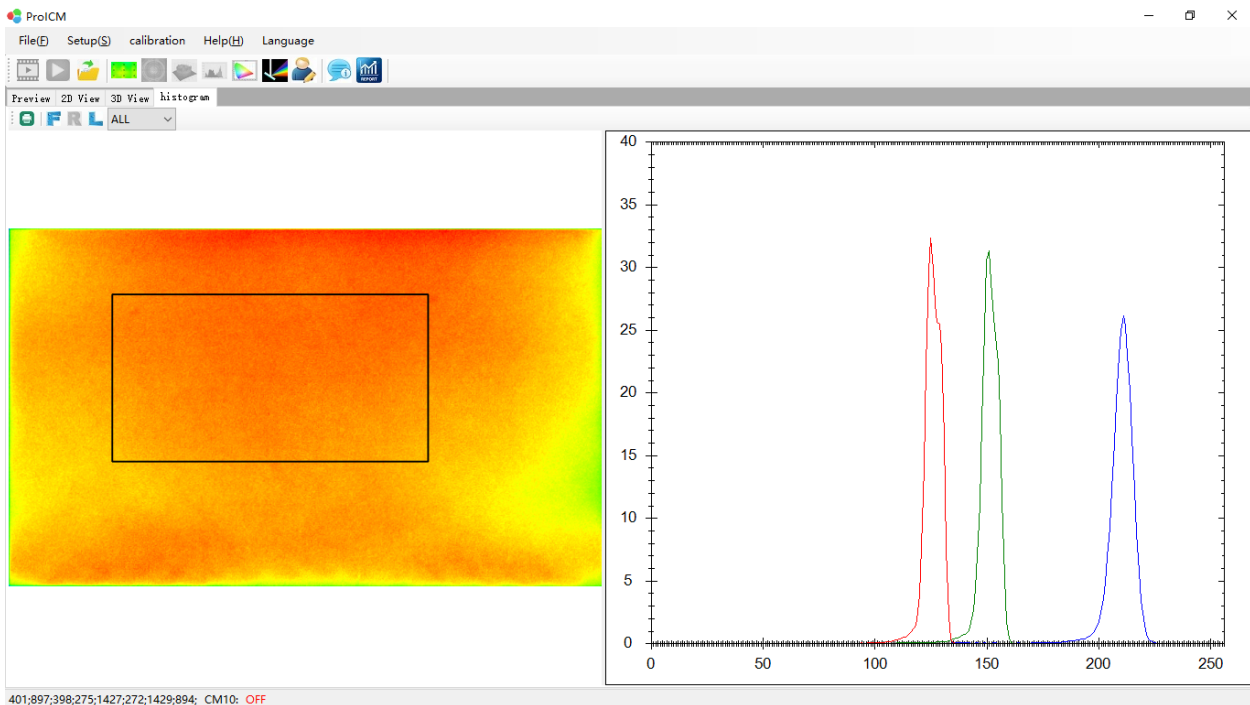
Optional different data parameters to display 3D view

6.5. Histogram

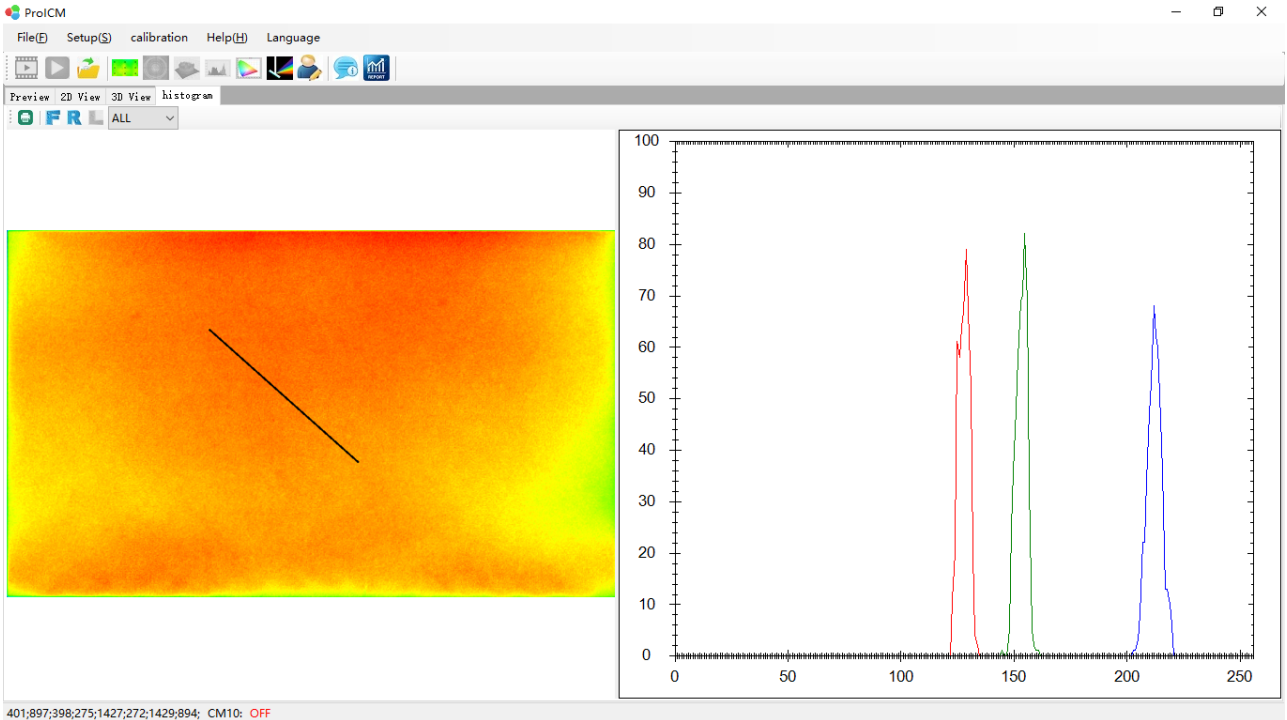
6.5. 1. Full-frame histogram analysis chart



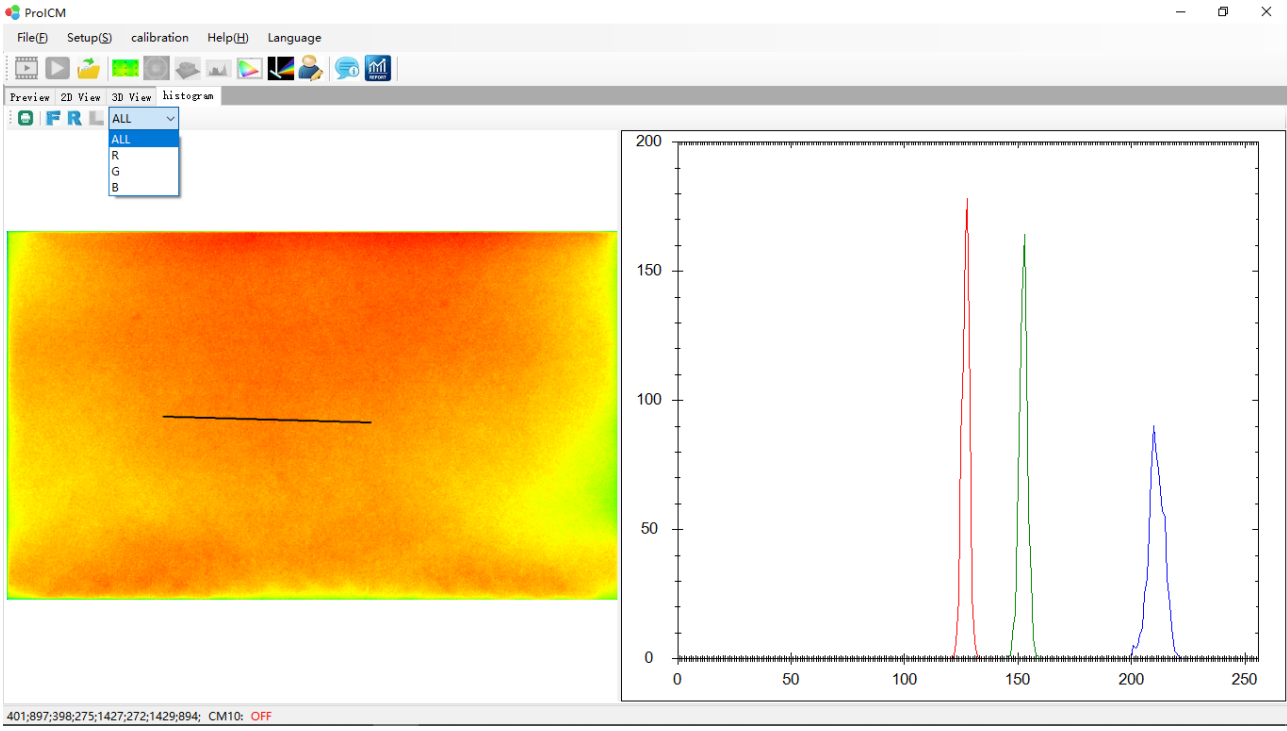
6.5. 2. Rectangular histogram analysis chart



6.5. 3.Line histogram analysis chart

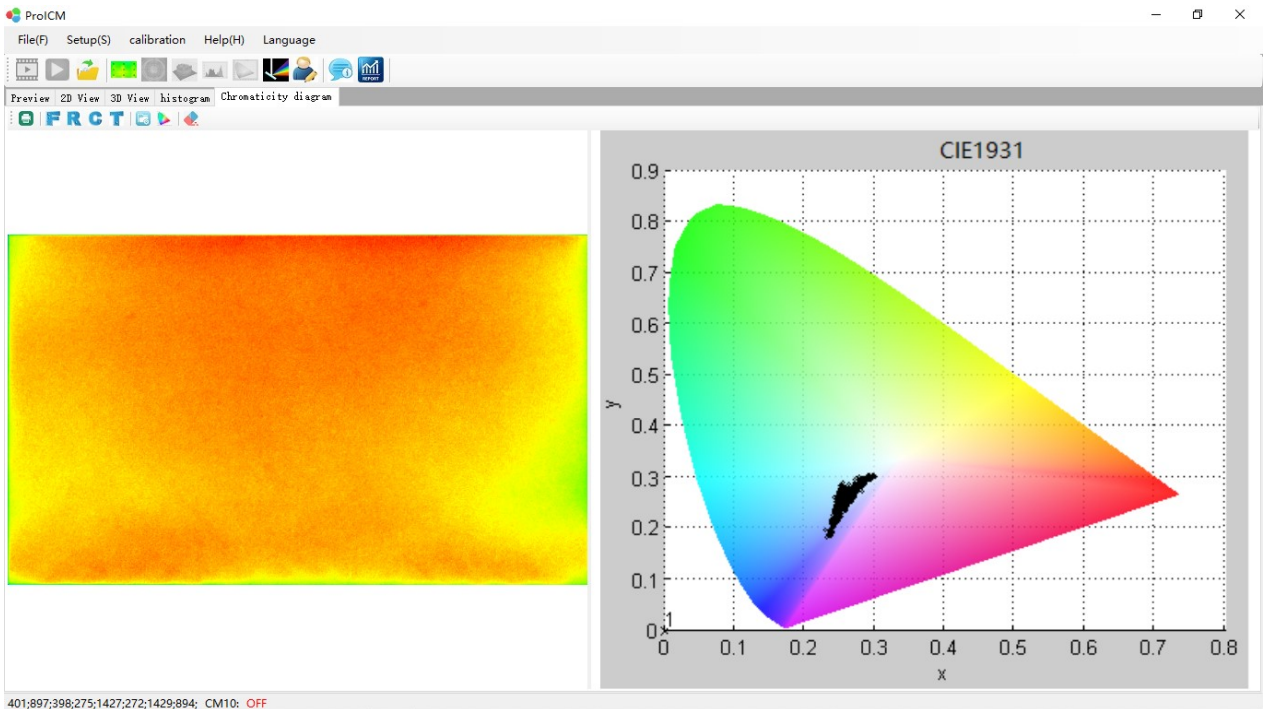


Optional R, G, B histogram

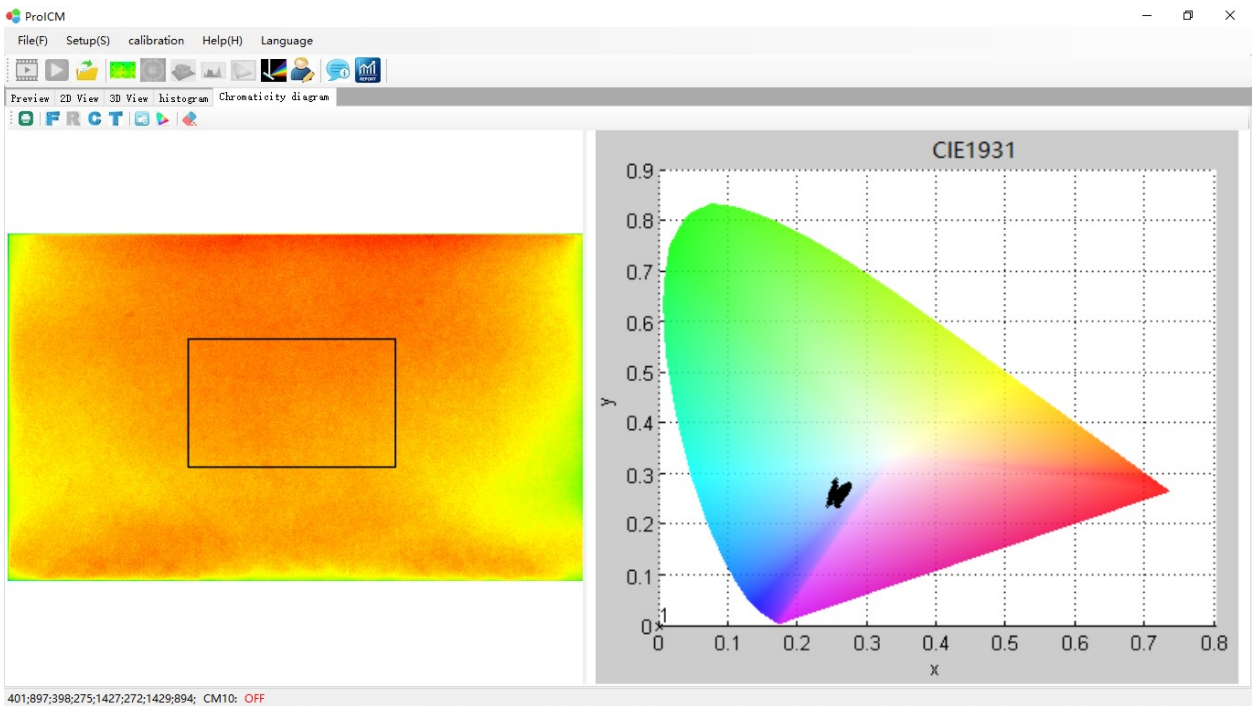


6.6. CIE Chromaticity

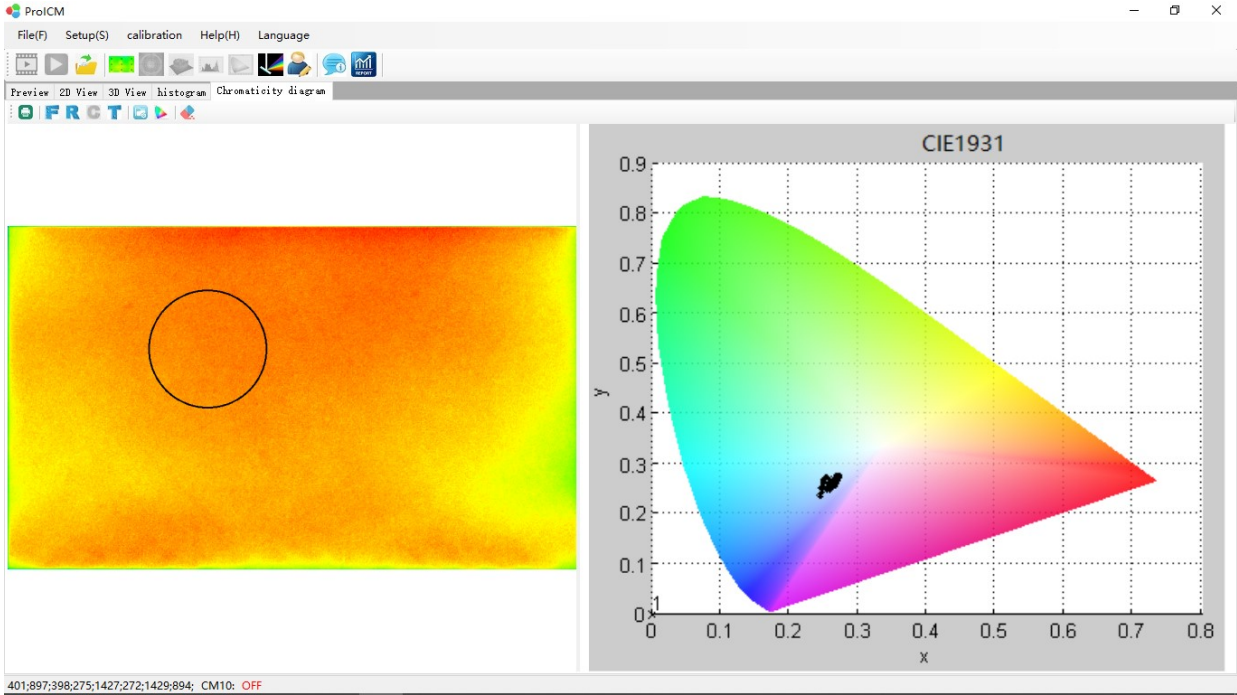
6.6. 1.Full frame CIE chart



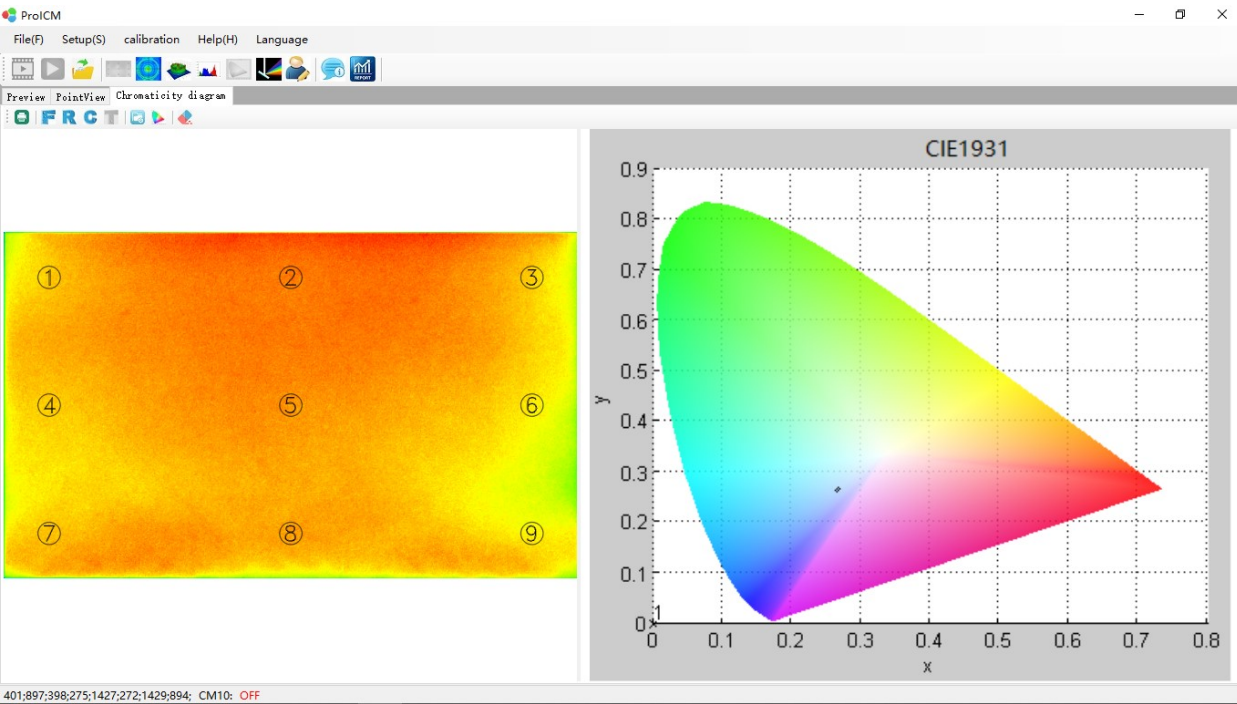
6.6. 2.Rectangular CIE chart



6.6. 3.Circular CIE chart

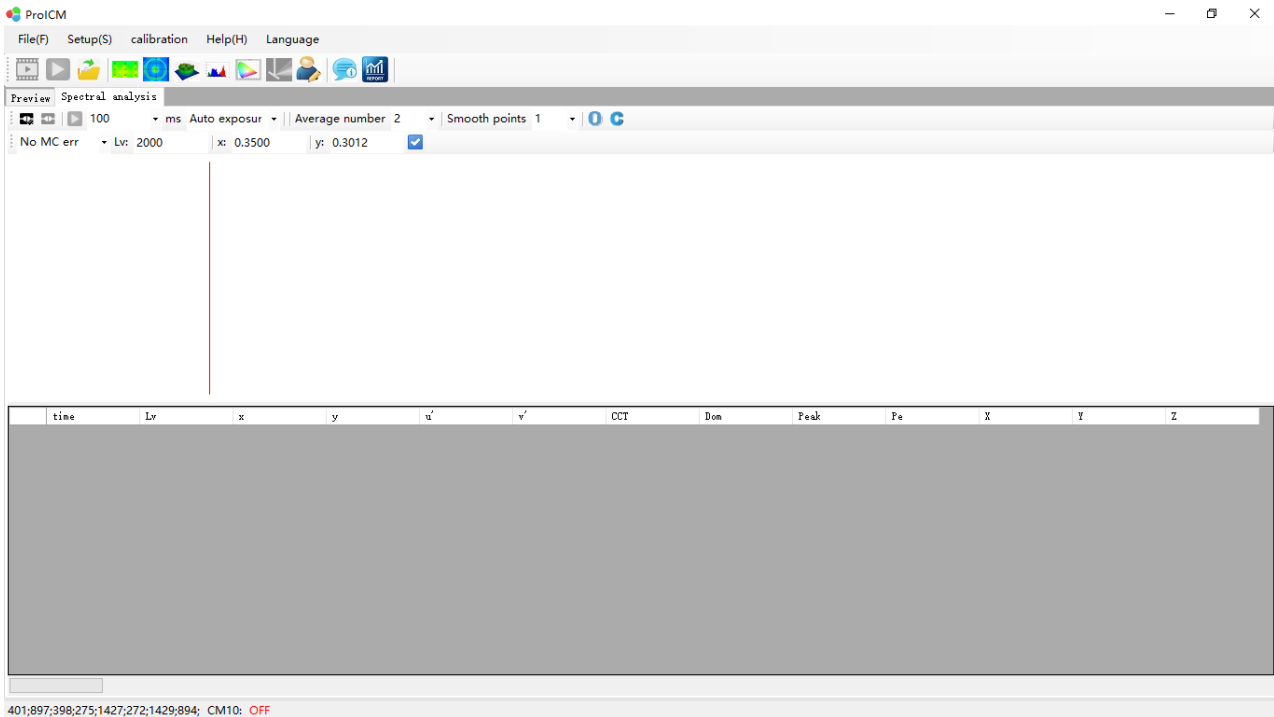


6.6. 4.Point CIE chart



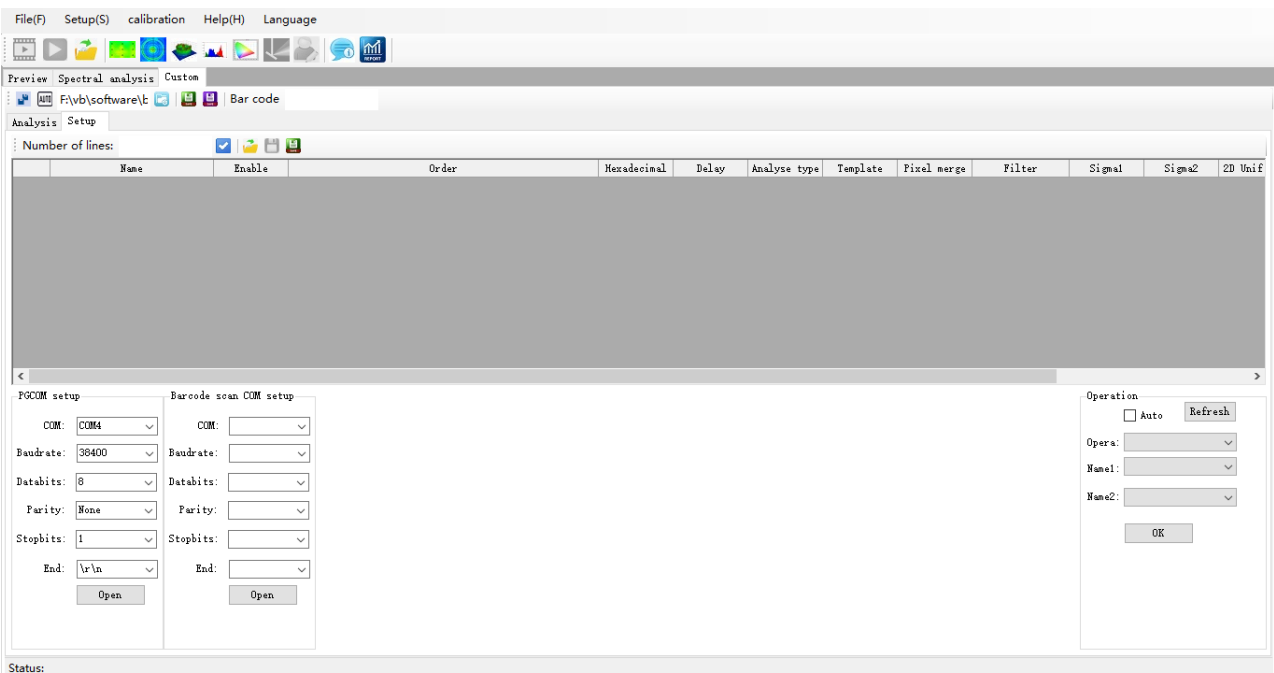
6.7. Spectral analysis function

Optional module



6.7. Customized analysis function

Optional module



7. Common faults and solutions

1、 "Instrument connection failed! Please check whether the data cable is connected and the power is turned on! Whether enter the demo mode?"

Solution: Check whether the power and the data cable, to restart the instrument and software. If it has not been solved, you need to set the IP address to automatically obtain IP and turn off the firewall.

2、 Prompt "only can open one program" when opening the software

Solution: open the task manager, close the software in the process, and restart it.

3、 Invalid calibration during use

Solution: Check whether the "lens distance" in the calibration settings is the same as the preview interface.

4、 Software crashes when clicking measurement button

Solution: Tick "Binarization" in the preview interface to adjust the appropriate threshold value, and get the recognition area with higher contrast in the video mode.

5、 Displayed distance does not match the actual distance

Solution: reset "size calibration"

6、 Unstable data, uniformity deviation

Solution: Check whether the instrument is perpendicular to the surface of product, place a mirror at the center of the lens, observe the software video area, adjust the direction of the instrument so that the lens inverted image is in the center of the cross auxiliary line, and tighten the screws.

7、 Any other questions, please contact us.

8. Attention

1. Please read this manual carefully and operate strictly according to the manual. Our company will not be responsible for any damage caused by human errors.
2. Do not touch the lens with your hands or sharp objects, keep the lens clean and tidy, close the lens cover when not in use, and keep the instrument in a dry and clean environment.
3. Do not disassemble the instrument without the permission of the company, otherwise, the company will not be responsible.
4. Specifications and appearance are subject to change without prior notice.
5. Please contact the manufacturer for calibration.
6. Any questions, please contact us.