



INSTRUCTIONS

Calibration Pro



USER MANUAL

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1. Brief introduction

Calibration software is specially developed for LED display systematic calibration in conjunction with Colorlight control system. Main features are listed as below:

- Calibration speed and performance are further amplified by adopting advanced image processing algorithms.
- Greatly improve the uniformity of LED display by analyzing image in pixel level.
- Intuitive. Clear layout structure, user-friendly interface, easy to learn and operate.
- Powerful functions. Calibration can be based on the whole LED display and single cabinet. Freeform display can also be calibrated after R&D evaluation.

1.1. Operational environment

Components of Colorlight' s calibration system

- Computer

One PC or two (in case of control end and analyzing end separated)

Operating system : Windows 7 with 64 bits system is recommended.

RAM >= 2G

Alternative:

Graphics card: DVI or other HD port (Using “by sender card” mode)

- Canon*1(we support Canon70D, Canon80D, Canon90D, Canon7D, Canon7D MarkII; Canon7D MarkII, Canon80D is recommended)



Fig.1-1 Canon Camera

- Lens*1((Canon) EF 70-300mm f/4-5.6L IS USM is recommended)



Fig.1-2 Lens

- Head*1(Manfrotto-410 is recommended)



Fig.1-3 Head

- Tripod*1(MT190GOC4TB -190GO is recommended)



Fig.1-4 Tripod

- AC adapter of canon camera*1 (alternative)



Fig.1-5 AC Adapter

- ND filter (alternative: using it in the condition of outdoor high brightness screen)



Fig.1-6 ND filter

1.2 Camera Assembly

1.2.1 Open the tripod

As shown in figure 1-7.



Fig.1-7 The tripod opened

1.2.2 Tripod Head Installation

Align the mounting hole at the bottom of tripod head with the positioning bolt of the tripod, and turn the head clockwise tightly. As shown in figure 1-8.



Fig.1-8 Head Installation

Finished installation as shown in figure 1-9.



Fig.1-9 Head installation completed

1.2.3 Lens Installation

(1) Following Fig.1-10 arrow direction, toggle the release lever of the heads to the appointed position.

(2) Adjust the lens direction consistent with the head's.

(3) Follow the steps below to complete lens installation:

Firstly, insert the base rear of the lens clip into the dovetail groove of the heads. And then press the front of the lens, and the release lever will rebound automatically. Finish lens installation, as Fig.1-11 shown.



Fig.1-10 Lens installation



Fig.1-11 Lens installation completed

1.2.4 Camera Installation

- (1) Rotate and remove the lens cover and the body cover.
- (2) Camera Installation: as shown in figure 1-12.

Firstly, to align the red or white mark between the lens and the camera; secondly, pushing the lens into the camera; lastly, to rotate the camera in the direction of the arrow shown until the lens snap into place.



Fig.1-12 Camera Installation

(3) Switch the lens focus mode to <AF>, and turn off the optical stabilizer(OS for Sigma, IS for Canon), as shown in figure 1-13.



Fig.1-13 Focus Mode

(4) For now, camera installation is complete (as shown in figure 1-14). Connect the camera to the computer via USB cable, and now you can begin to calibrate.



Fig.1-14 Installation completed

1.3 Software installation and un-installation

1.3.1 Installation

1) Double-click the installation icon  Calibration_Setup, select a language

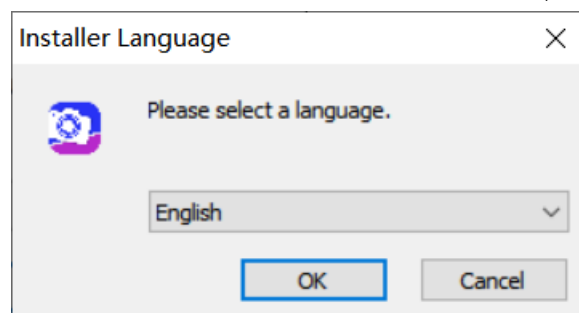


Fig.1-15 Installer language

2) Enter welcome interface.

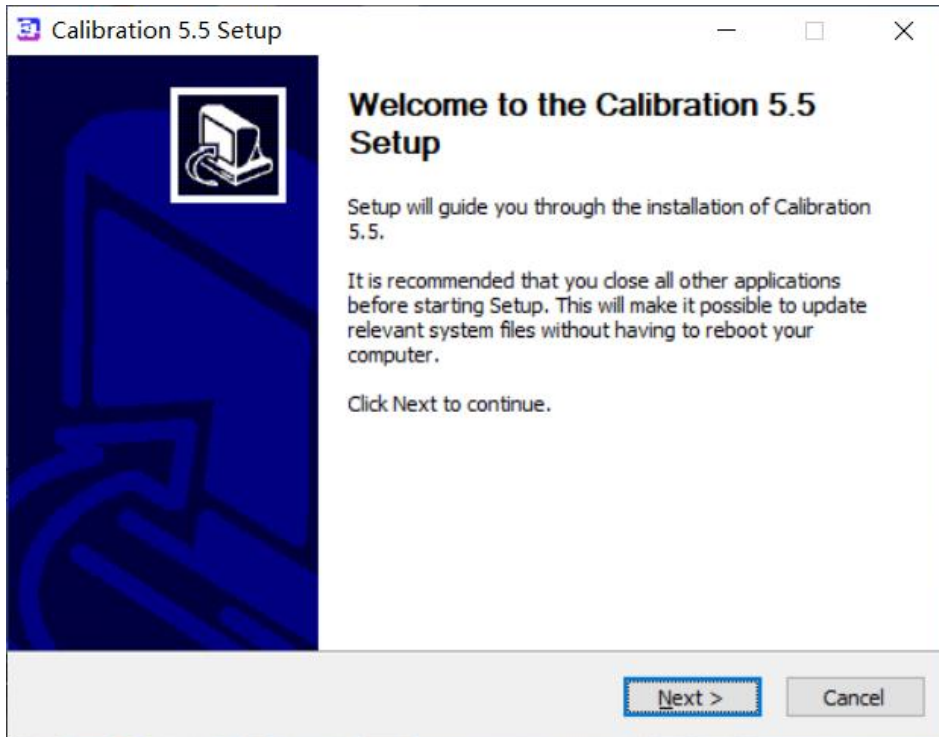


Fig.1-16 Welcome page

3) Choose a directory for installation and click [**Next**].

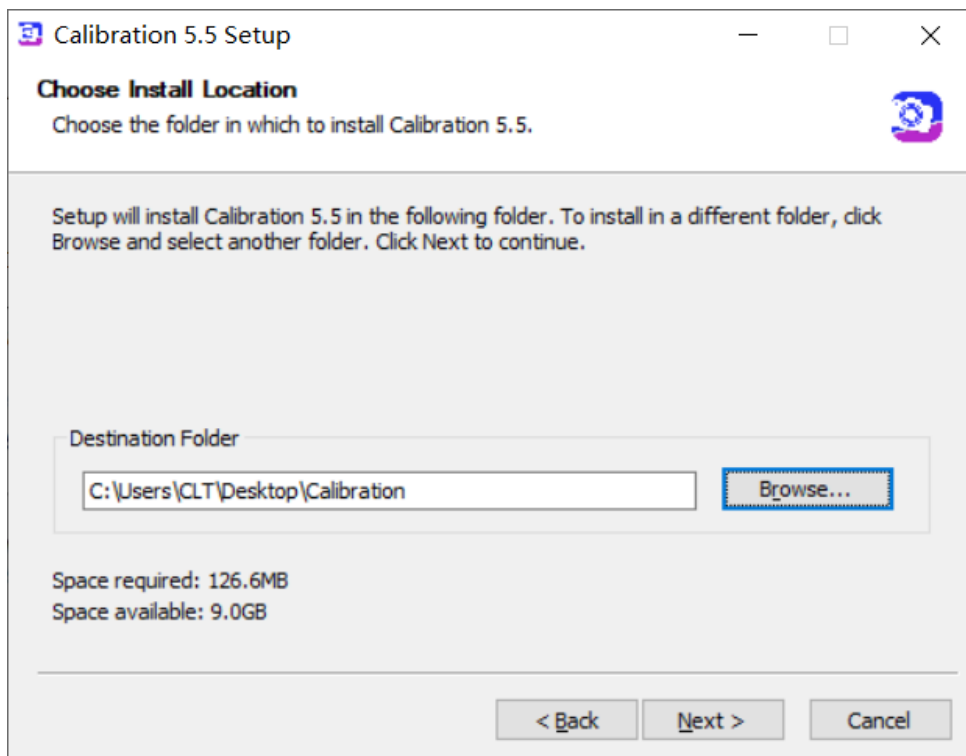


Fig.1-17 Choose install location

4) Choose components.

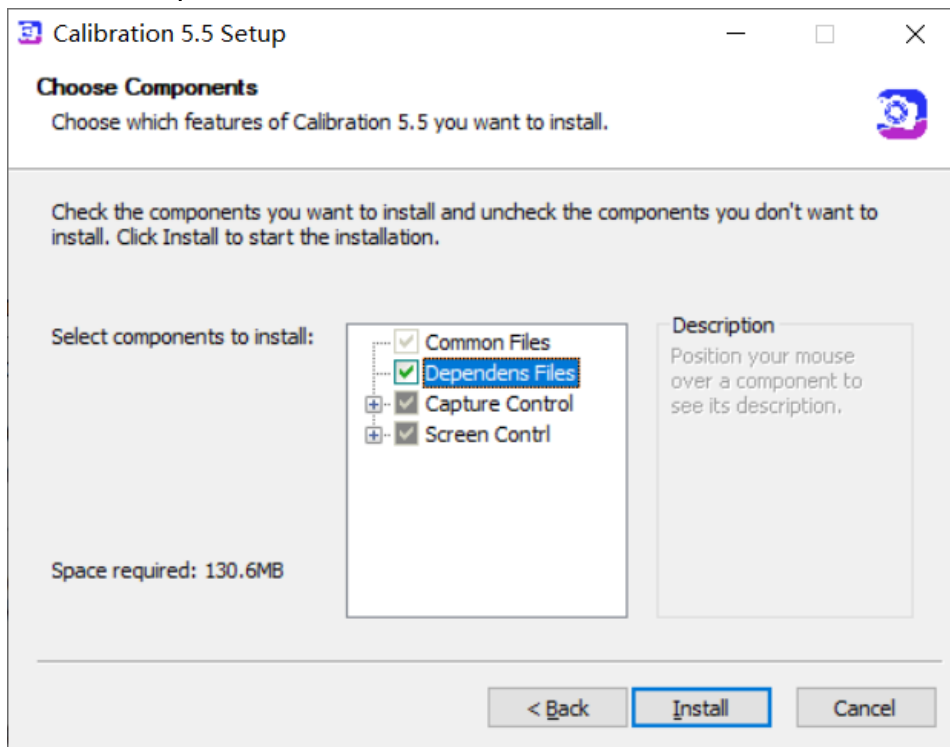


Fig.1-18 Choose components

5) Finish installation.

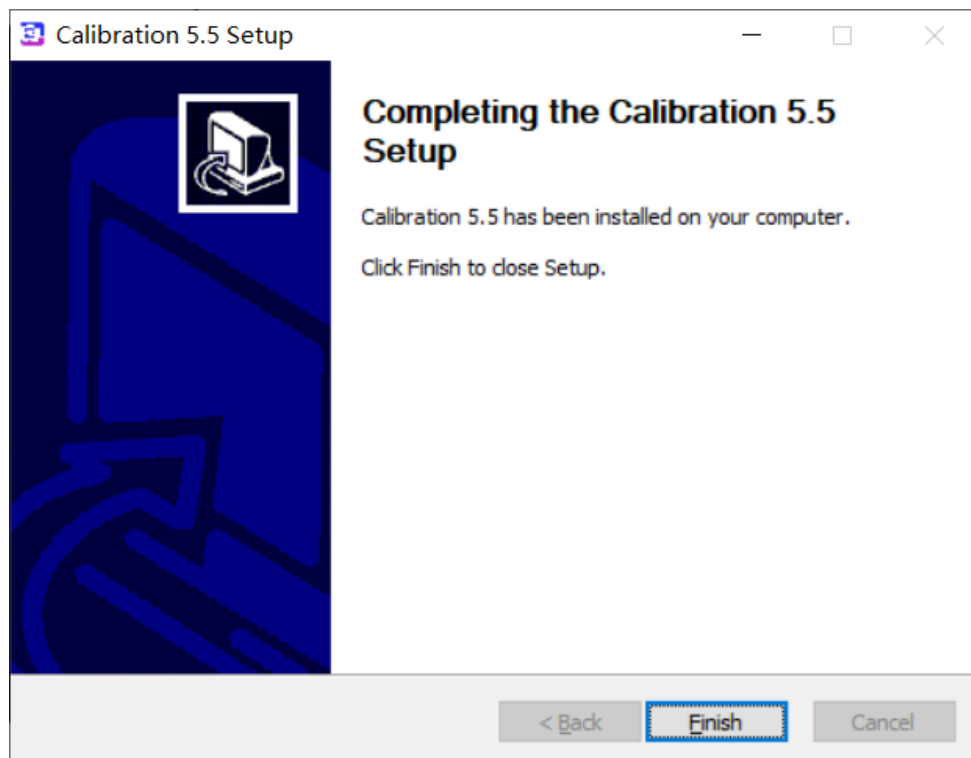


Fig.1-19 Setup completion

Software can be run directly after installation, desktop shortcut will



be generated automatically by system, right-click [Run as administrator] to run the client application

1.3.2 Un-installation

Internal uninstall application: select [all application→ calibration→ uninstall] from the start menu, software can be removed automatically.



Fig.1-20 Uninstall application

2. Calibration Instruction

2.1 Software interface

When open the software, the main interfaces (shown as Fig.2-1) will appear. Preview interface is for server application and operation interface is for client application, also work when you separately run them on two computers.

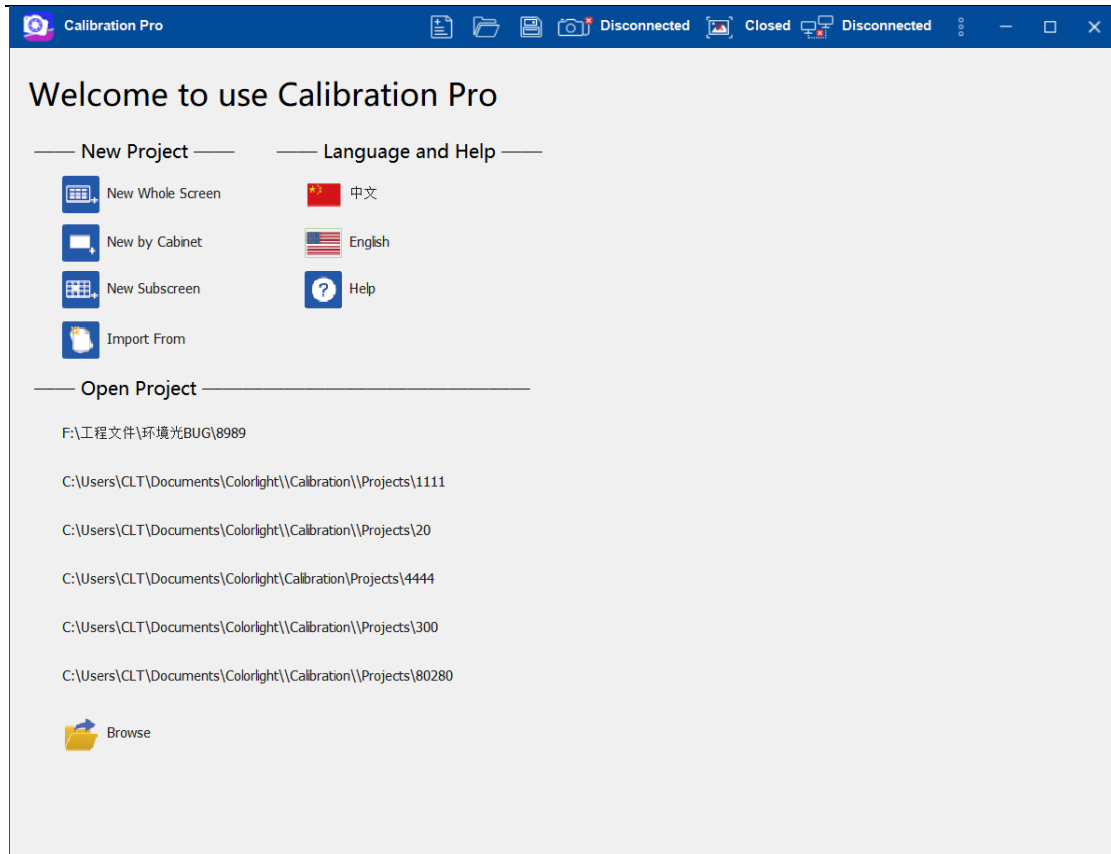


Fig.2-1 Client

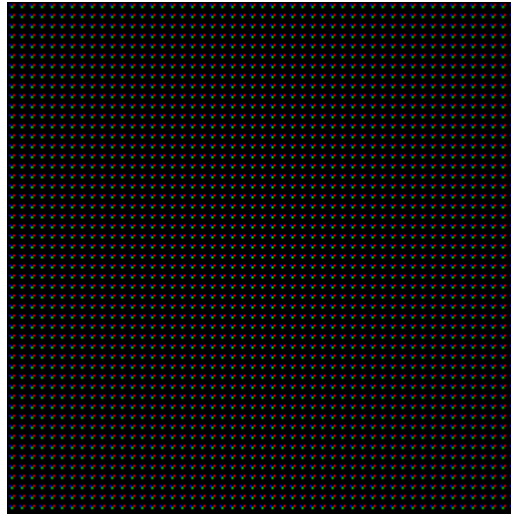


Fig.2-2 Server

2.2 Homepage

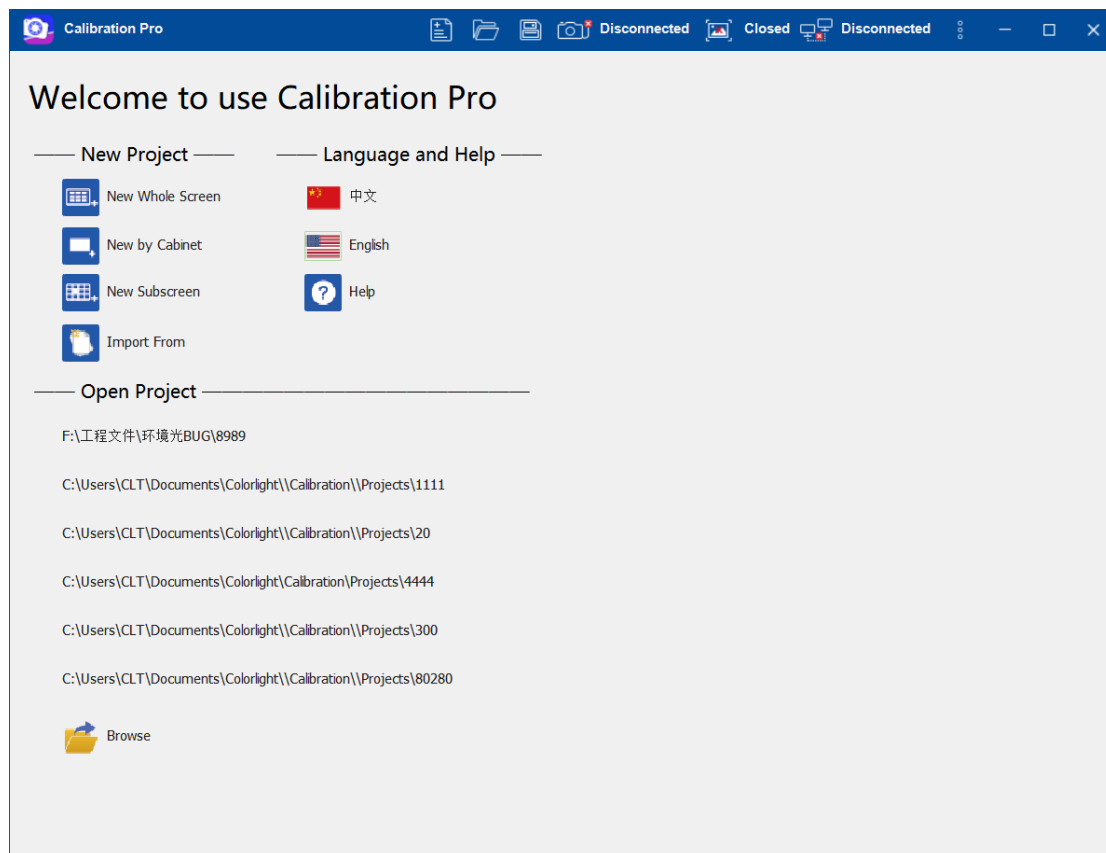









Fig.2-1 Homepage

2.2.1 New project

-  **New Integrated:** Open new integrated wizard.
-  **New Cabinet:** Open new Cabinet wizard.
-  **New Subscreen:** Open new subscreen wizard
-  **Import From:** Open import wizard.

2.2.2 Language and help

-  **中文:** Switch to Chinese.
-  **English:** Switch to English.
-  **Help:** Open the software manuals.

2.2.3 Open Project

Recent projects will be shown here, you may click to open them.



Browse: Open calibration project file you choosed.

3. Integrated calibration

3.1 Configure the screen

Set the right parameters for display through LEDVISION (disable brightness calibration), then send and save the setting data to the receiver card.

Note: please close the LEDVISION after configuring parameters, then enter to Calibration.

3.2 Create a New Calibration

Step 1: New Project Wizard-1

Open the software, select the  **New Integrated** to create a calibration (shown as Fig. 3-1)

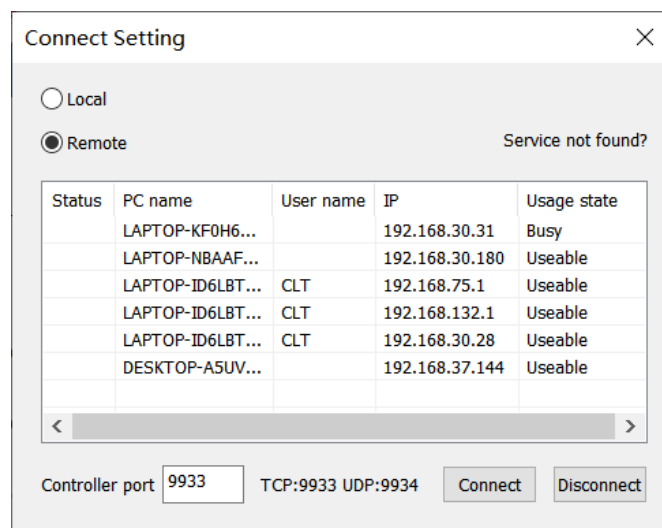


Fig.3-1 Project wizard-1

Choose the calibration type, Local or remote.

Choose the calibration type: Local or remote. ‘Local’ means the client and server of Calibration will be executed in the same computer; In otherwise, you should choose ‘Remote’ .

Step 2

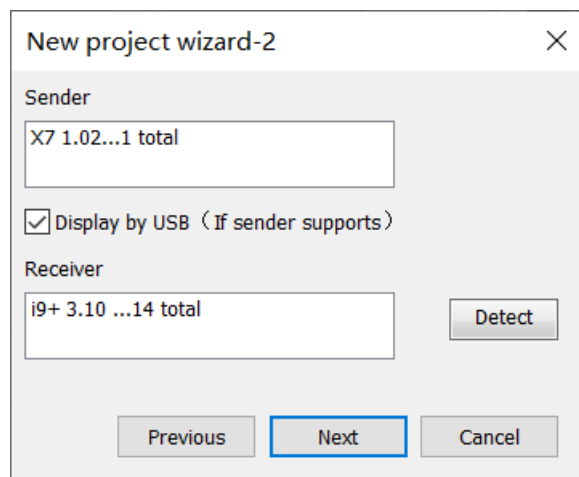


Fig.3-2 Project wizard-2

This step is about the senders and receivers of the screen, the software will detect them automatically. Check if they are detected as expected and then click ‘Next’ .

Step 3

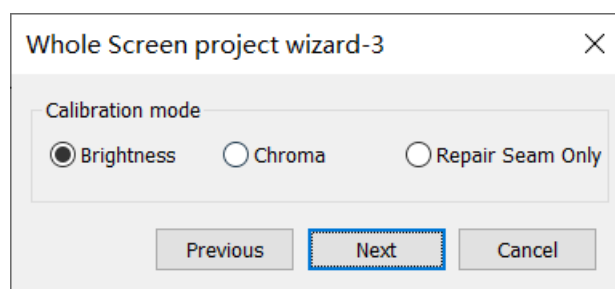
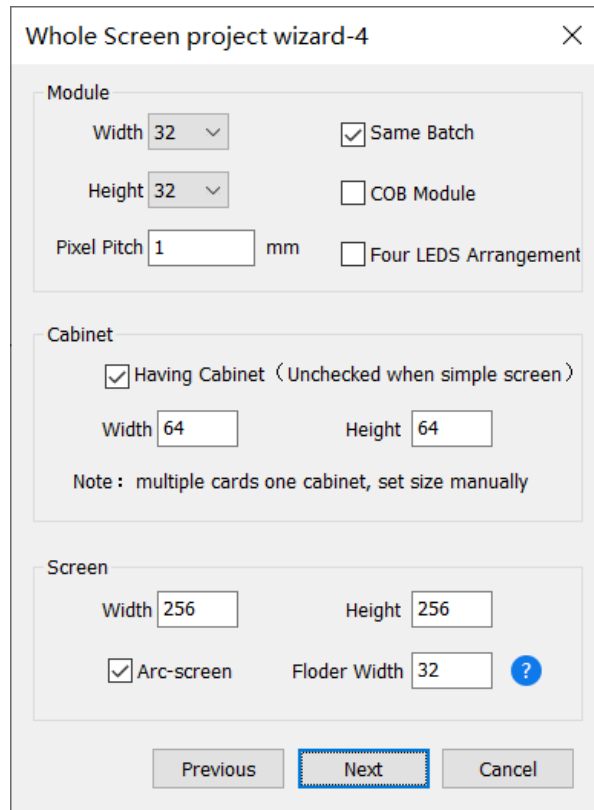


Fig.3-3 Project wizard-3

Choose calibration mode as desired.

Step 4



Whole Screen project wizard-4

Module

Width 32 Same Batch

Height 32 COB Module

Pixel Pitch 1 mm Four LEDs Arrangement

Cabinet

Having Cabinet (Unchecked when simple screen)

Width 64 Height 64

Note : multiple cards one cabinet, set size manually

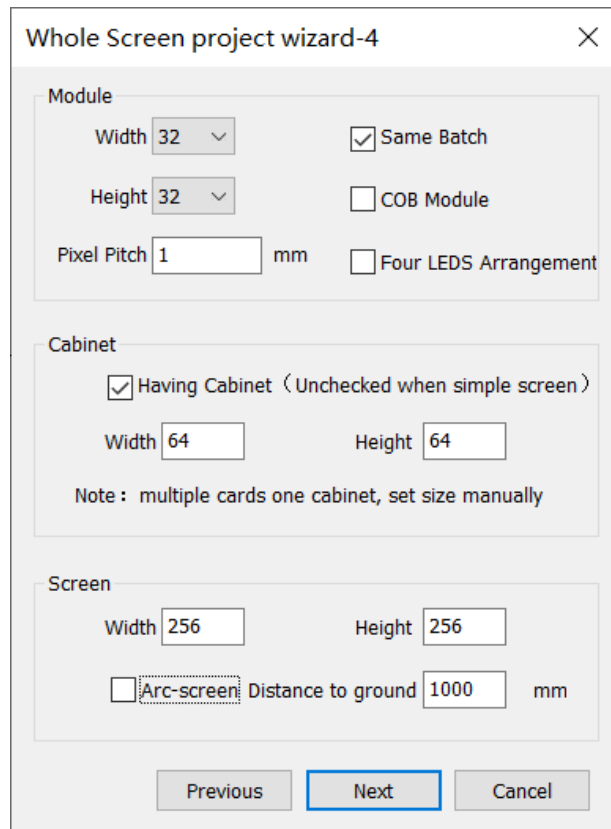
Screen

Width 256 Height 256

Arc-screen Floder Width 32 ?

Previous Next Cancel

Fig.3-4 Project wizard-4



Whole Screen project wizard-4

Module

Width 32 Same Batch

Height 32 COB Module

Pixel Pitch 1 mm Four LEDs Arrangement

Cabinet

Having Cabinet (Unchecked when simple screen)

Width 64 Height 64

Note : multiple cards one cabinet, set size manually

Screen

Width 256 Height 256

Arc-screen Distance to ground 1000 mm

Previous Next Cancel

Fig.3-5 Project wizard-4

The **Whole Screen project wizard -4** (Fig.3-5) dialog box contains the following items:

“Module Width” 、 “Module Height” 、 “Screen Width” 、 “Cabinet Width” 、 “Cabinet Height” 、 “Screen Height” 、 “Pixel Pitch” . The software can automatically display the information of the above items.

If there is more than one sender, you need to manually enter the width and height of the screen. If there is no smart module, you need to select the width and height of the module.

Having Cabinet: Checked by default. Clear the check box if the screen is simple screen.

Same Batch: Select the check box if all cabinets of the whole screen belong to the same batch; clear the check box if the cabinets belong to different batches.

COB Module: Select the check box if the screen to be calibrated is COB display screen.

Four LEDS Arrangement: Select the check box if the screen to be calibrated is Four LEDS Arrangement screen.

Pixel Pitch: The software will automatically display the value if the client is connected to the server; the default value is 0, which is invalid, if the client is not connected to the server. You can manually enter the actual value of the pixel pitch.

arc-screen: Select the check box if the screen is an arc-screen combined by hard modules or cabinets. Folder width refers to the number of pixel columns between the fold lines (as shown in Fig.3-4) .

tance to ground: The screen height above the ground, for automatic recommendation for shooting distance.

Step 5

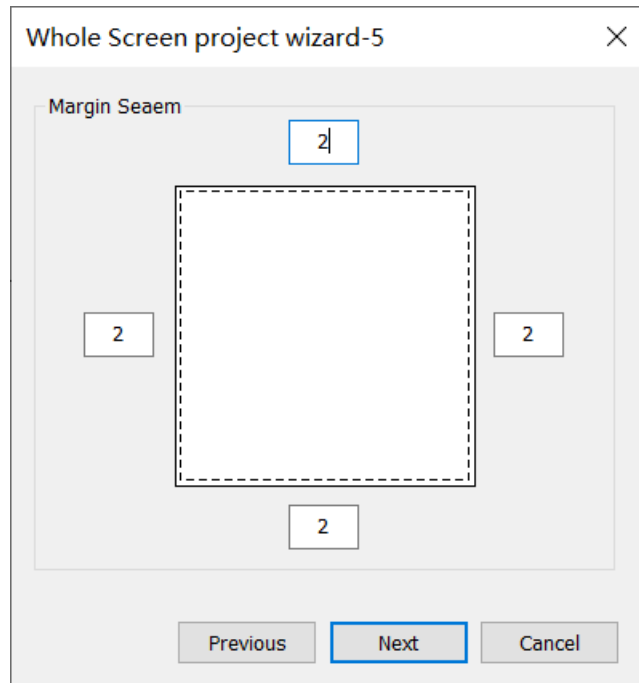


Fig.3-6 Whole Screen Project wizard-5

Edge Reserved is used when the lamps on the edge of the screen is blocked.

Step 6

1. The wizard 6 is shown like 3-7 when the sender is not connected receiver or no sender connected or only one sender connected.

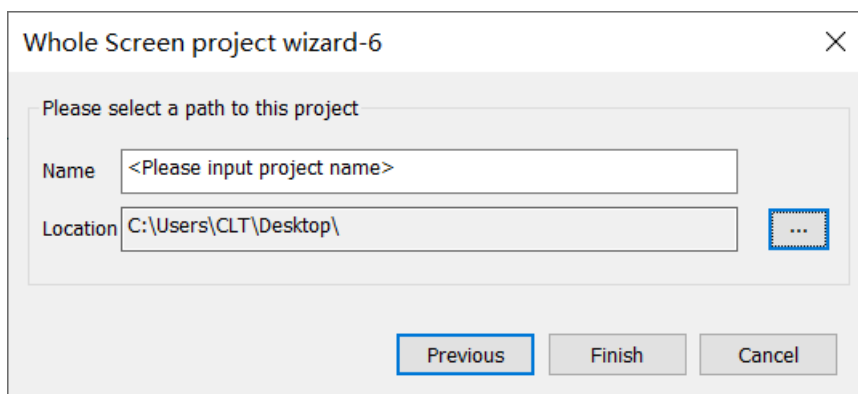


Fig.3-7 Project wizard-6

Name: By default, it is < please enter the project name >, you need to re-enter the project name.

Location: The path to save photos and other data generated during calibration.

click next to entry main interface.

2. The wizard 6 is shown like 3-8 when the number of sender is more than 1.

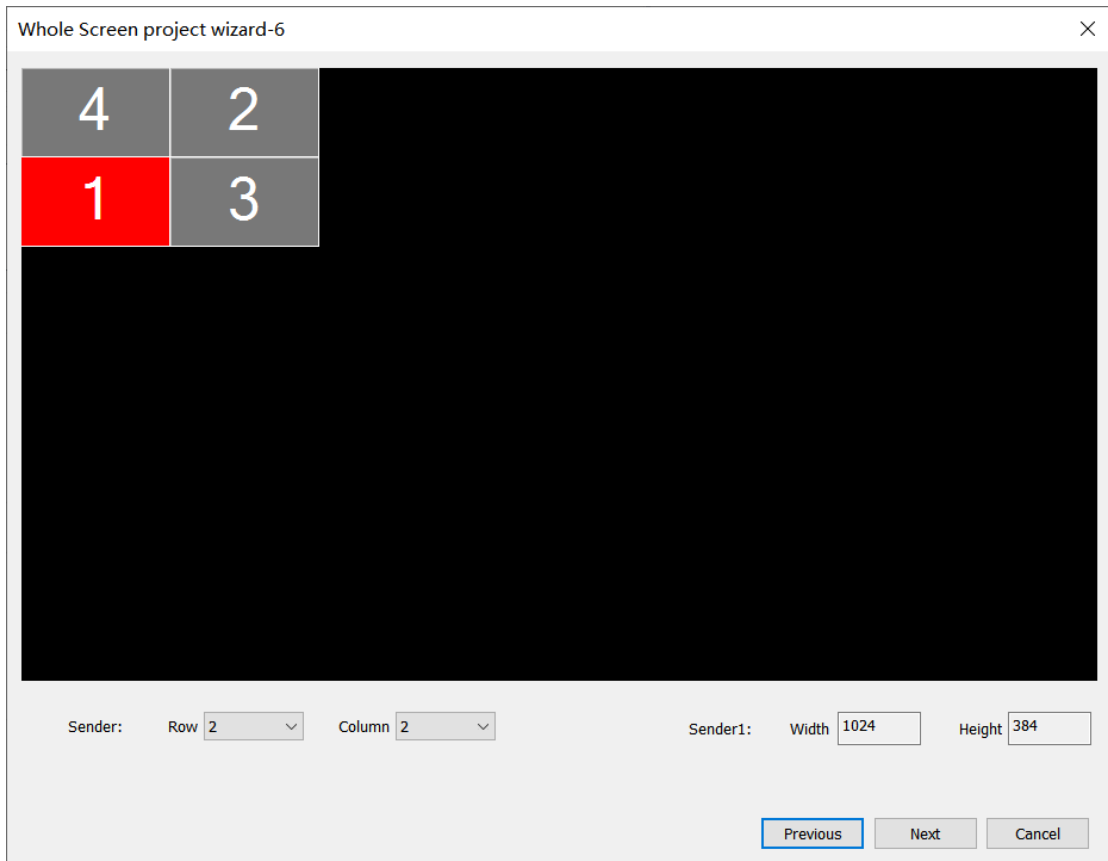


Fig.3-8 Project wizard 6

- 1) **Sender Row/Column:** Set the sender row and column according to the actual sender layout.
- 2) **Sender Width/Height:** Current selected sender width or height.

click next to entry wizard 7.

Step 7

It is shown as fig.3-9

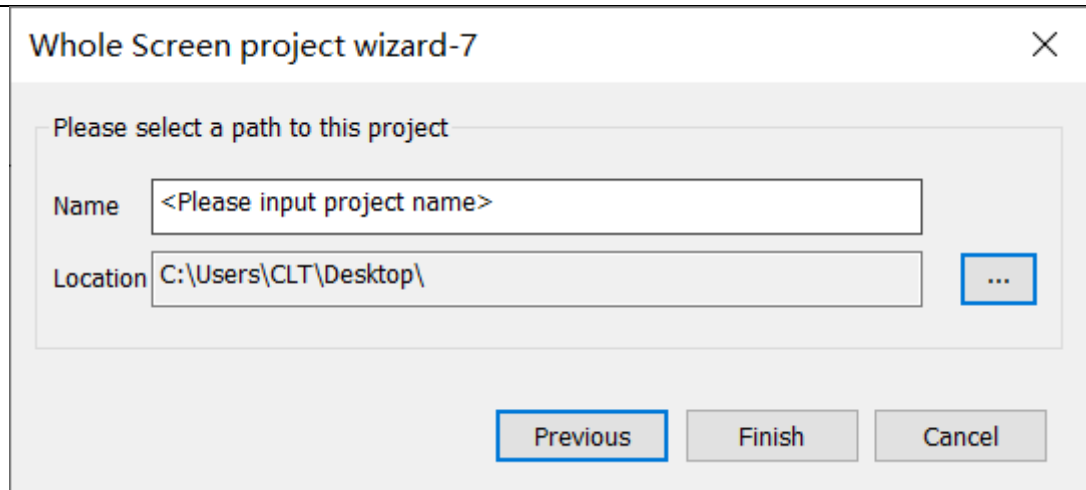


Fig.3-9 Project wizard 7

3.3 Connect to Server

Running calibration, select [**setting** -> **Connect**] to enter setting page, and input the correct server IP. (Running CMD.exe and input [**ipconfig**] then you can get this computer IP address is 127.x.x.x). The server port is the same as the client (the server port default is **9933**, please do not change if not necessary)

Ensure that the client and the server are in the same network area if you select [**Remote**].

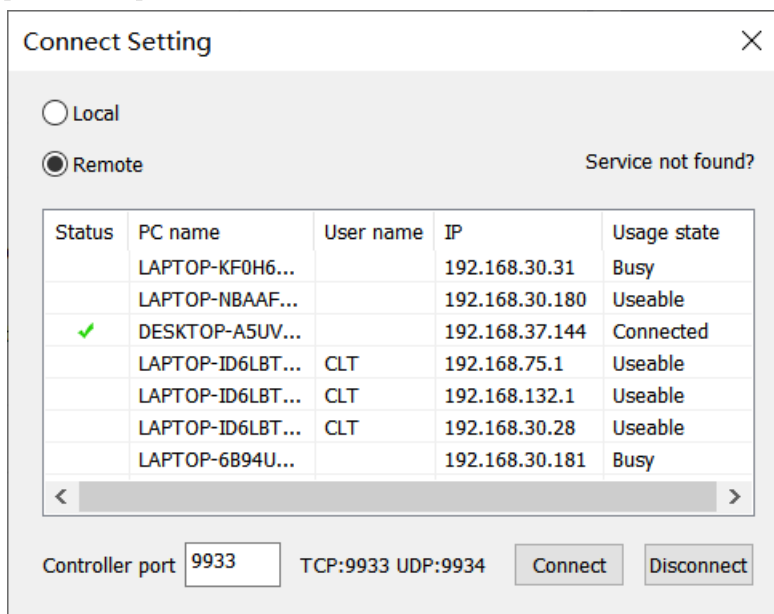


Fig. 3-10 Server Port Connect Window

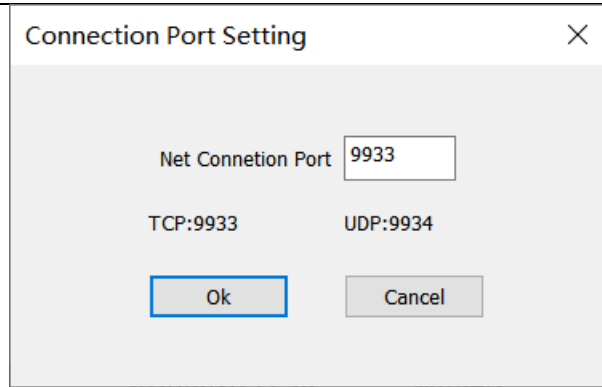


Fig. 3-11 Server Connection Pot Window

Check the client status bar to make sure the client and server port has been connected. As shown in Fig.3-12.

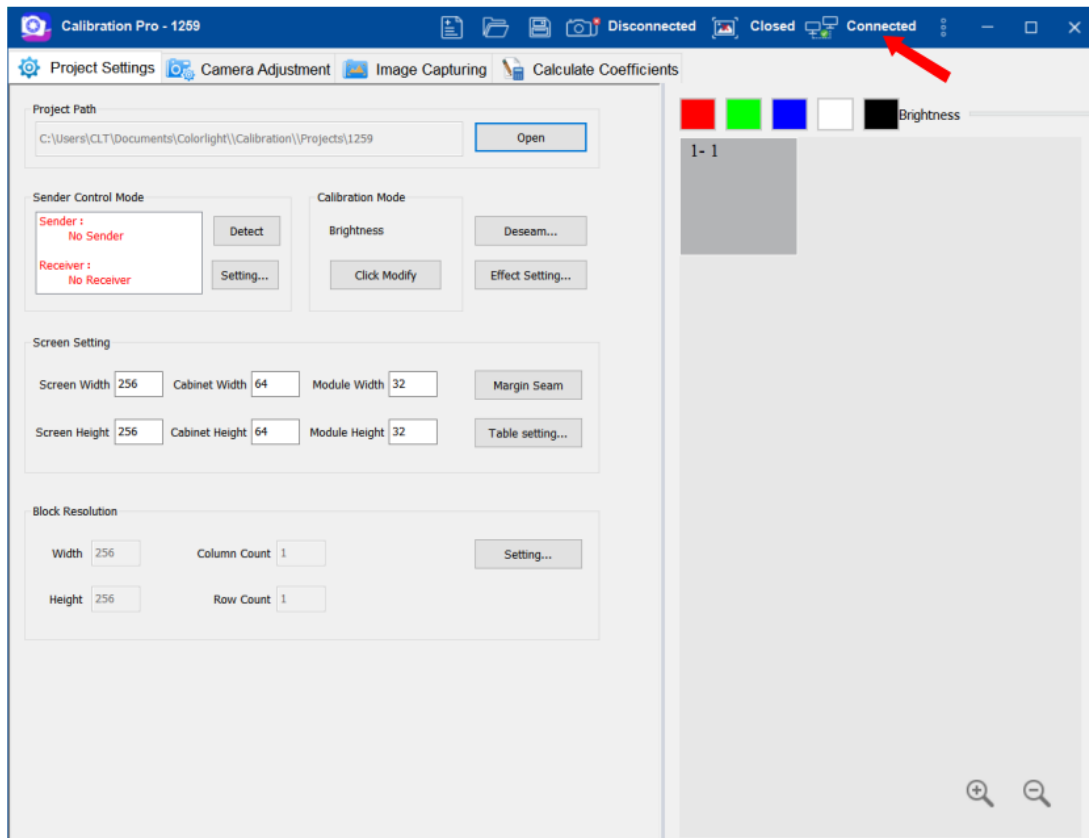


Fig.3-12 Successful Connection Tip

CaliProServer support up to 64 senders.

3.4 Screen display

3.4.1 Display with sender card

While the server is connected, the client will detect sender card and receiver card automatically. Result will be shown as Fig.4-15 sender control mode

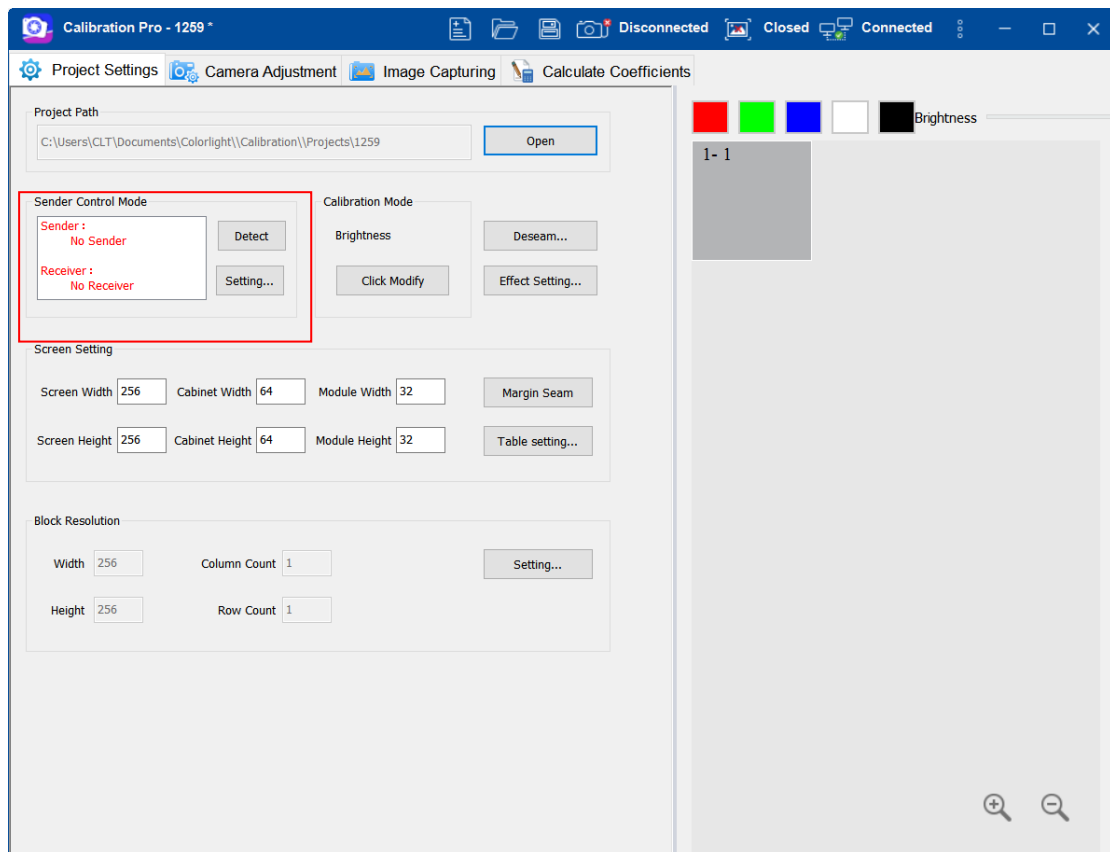


Fig. 3-15 sender control mode

Detect: detect sender card and receiver card immediately.

When you have more than 1 sender card, you should set as section 3.4.2.1.

3.4.1.1 Sender Card Setting

Clicked [**Sender Card Setting**] to set sender cards. As Fig. 3-16:

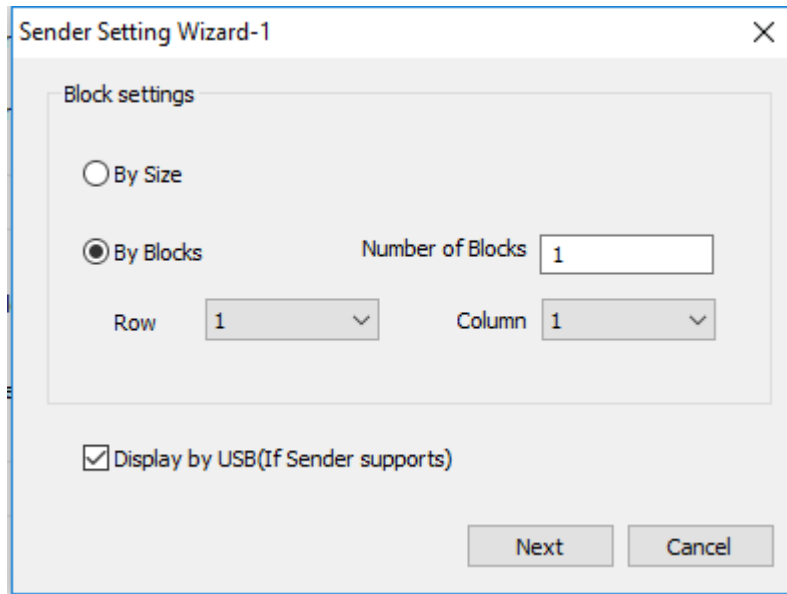


Fig. 3-16 Sender Card Setting Wizard-1

NOTE:

Block Setting-----1) by Size Divide the screen by the size of block;
 2) by Blocks When selected [**Rule Layout**], divide the screen according to rows and columns , otherwise average divide the screen width;

Export Setting----- Set the name rule of exported coefficient file;

Display by USB----- Use USB to control the display of screen.

After set the rule of sender cards according to the actual area controlled by sender card, clicked [**Next**], then show the view(as shown Fig. 3-17):

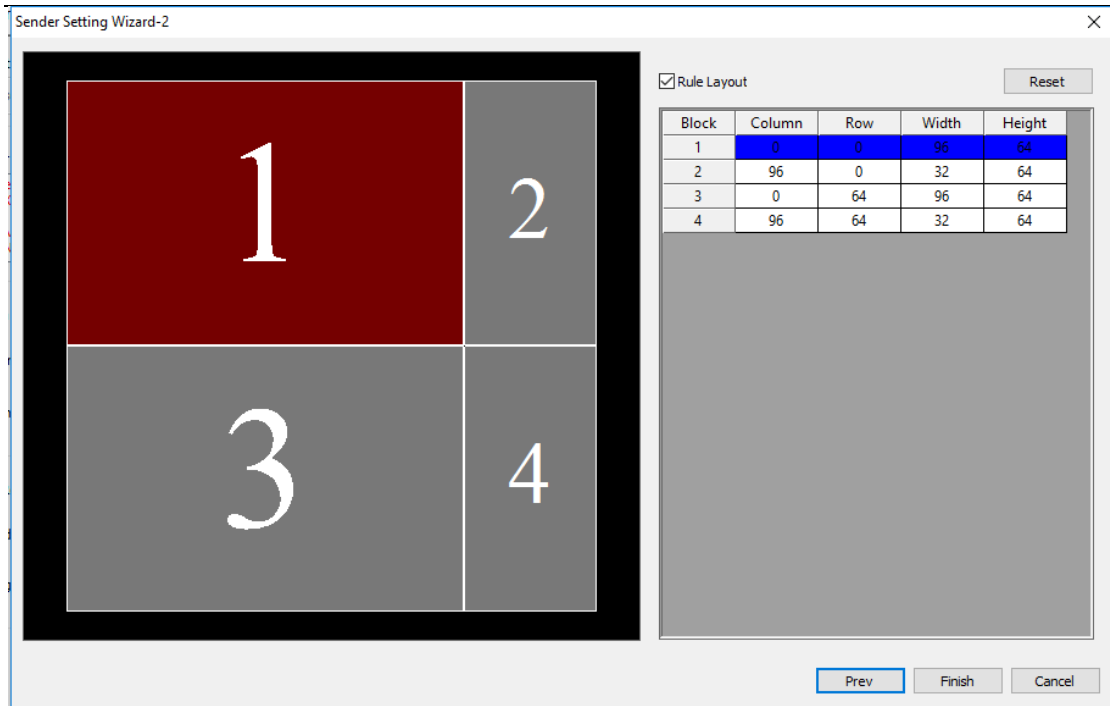


Fig. 3-17 Sender Card Setting Wizard-2

When the Setting doesn't match the actual, you can modify the parameters of corresponding partition.

Rule layout: The sender cards in the same row can only have the same height; Similarly, the sender cards in the same column can only have the same width.

Reset: Reset all sender cards' layout.

You can drag the sender card in the left side to exchange with others, you can also resize the sender card(s) with dragging the boundary in terms of module size.

3.5 Basic parameter setting

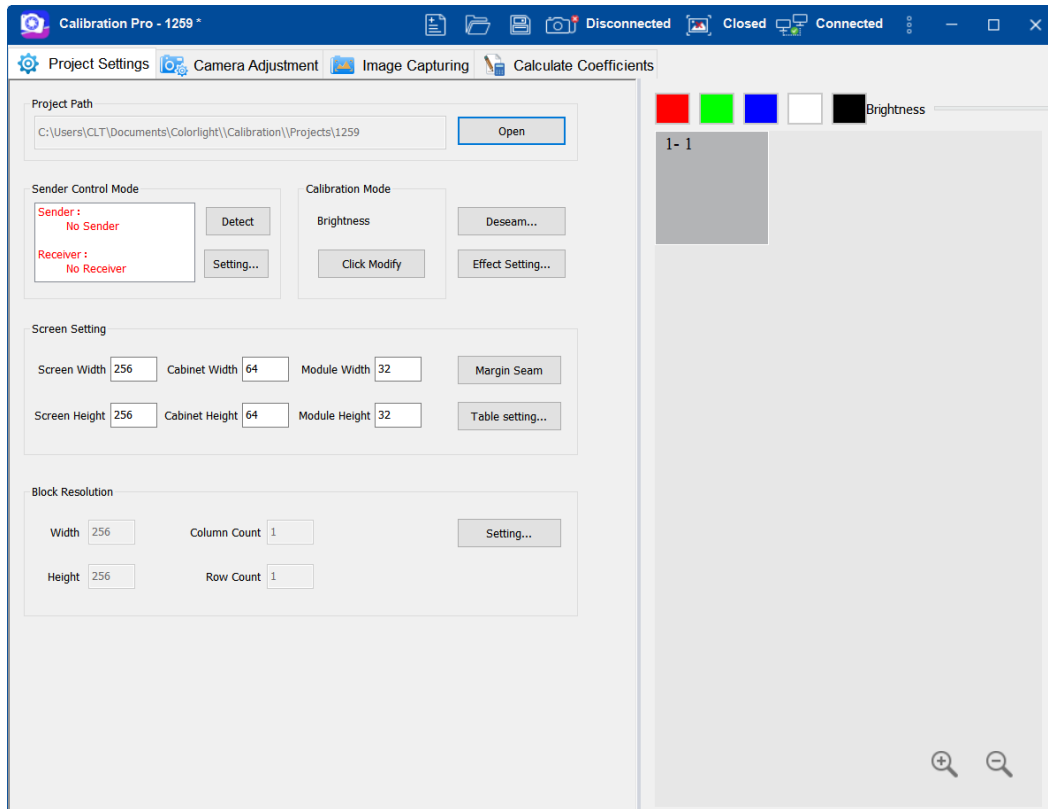


Fig. 3-18 Basic Parameter Setting Window

Corresponding to select the send mode and the calibration mode.

See chapter 5 for more details on deseam settings and chapter 6 for more details on display effect settings.

Set the actual size of the screen, cabinet and module to the correspond editors. For more details on Margin Seam settings refer to Fig.3-19.

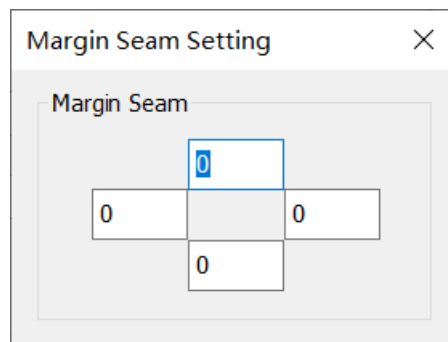


Fig. 3-19 Margin Seam Setting Window

The Margin Seam settings should according to the field situation. See Fig. 3-20 for more details on tablecloth settings.

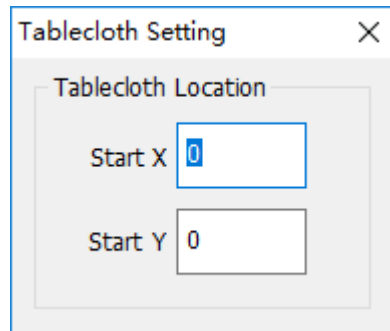


Fig. 3-20 Tablecloth Setting Window

Change tablecloth location to set the screen offset.

Block Resolution: The numerical size is determined by camera resolution. We suggest the width×height of a single photo is 150×100.

Note: The last row and the last column cannot be too small; you can view **Setting** in the [**Block Resolution**] area(as shown Fig. 3-21).

You can click **Setting** and enter the number of skip points in the **Spick Number** area in the pop-up window. The number of skip points must be odd if the screen to be calibrated is **Four LEDS Arrangement** screen.

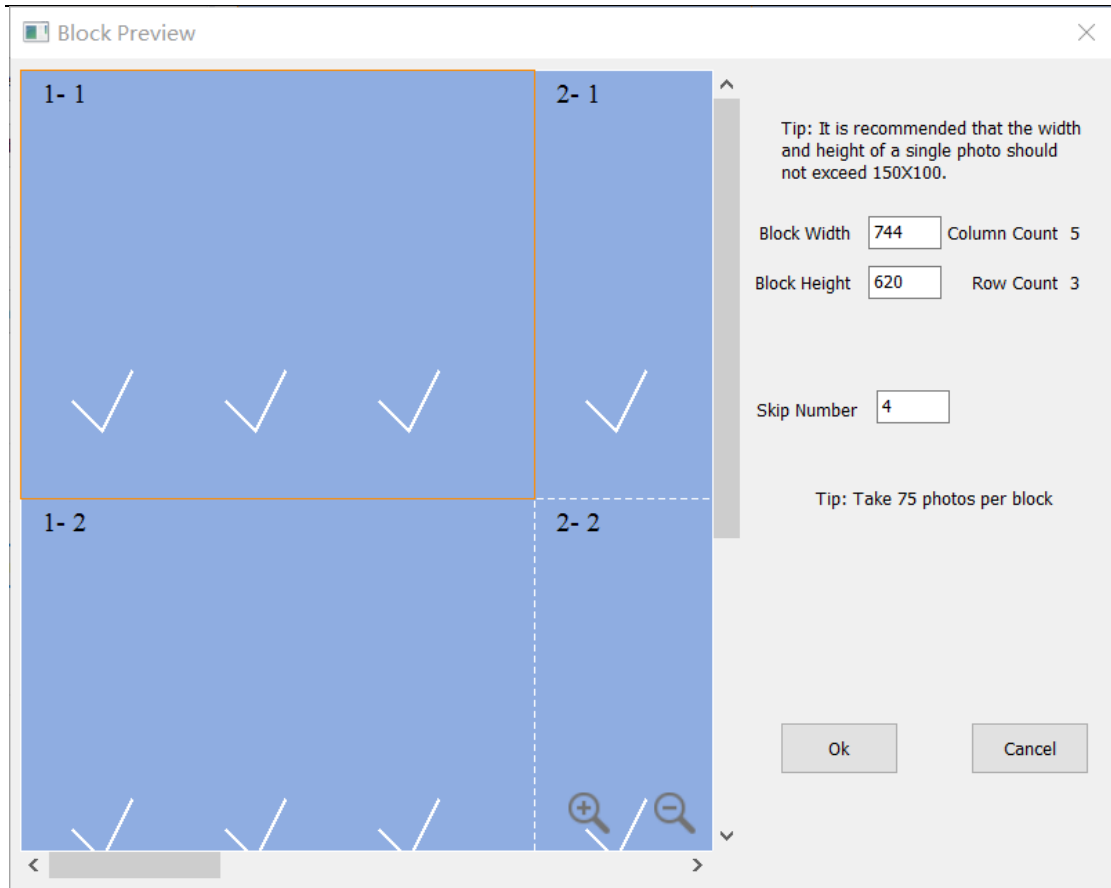


Fig.3-21 Block Preview Window

Select [**block preview**] → [**block map**], and choose one block from it as camera adjustment area. At this time, the corresponding area on LED screen will be selected and lighted (present in the form of white frame plus LED tricolor).

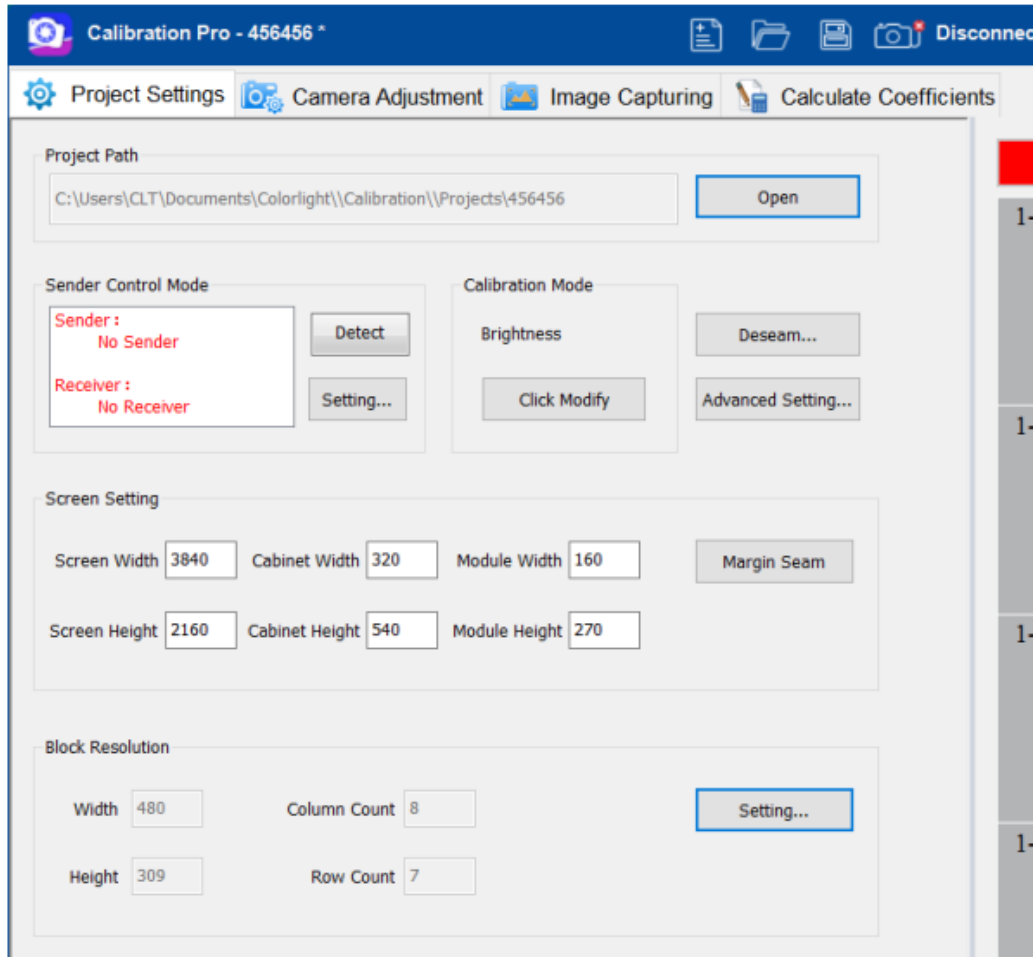


Fig.3-22 Block resolution setting

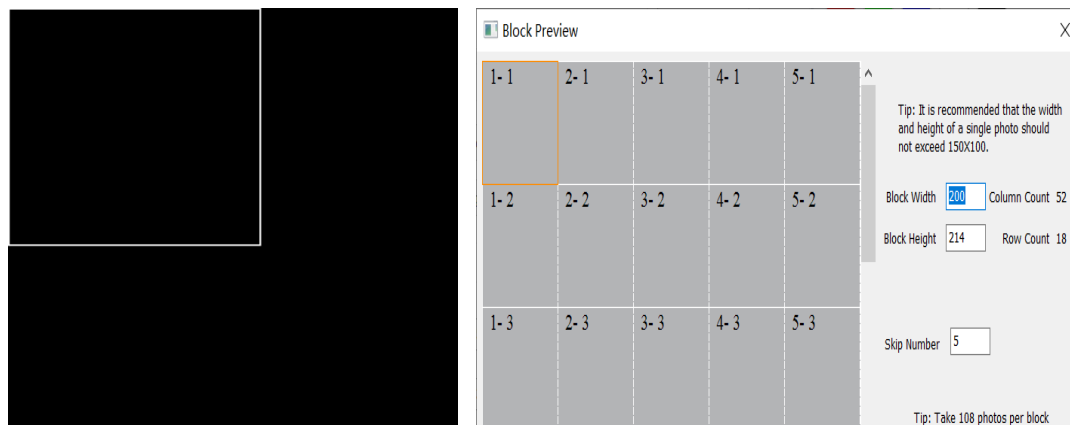




Fig.3-23 Operation Effect

3.6 Camera preparation

1. To set up the camera
2. Start the camera and shift to **M mode**, and then connect to the computer via USB cable.

3. Select [**connect camera** ] in the tool bar. Its icon will be changed to  after the connection finished.

4. Select [**start EVF** ], which is in the tool bar too. Its icon will be changed to  after that. At this time, the real-time scene can be seen on the monitoring area.

5. Accommodate camera to enable the selected area of the LED display to fall into the white square frame of monitoring area.

- a) The selected area should be parallel to the square frame.
- b) The selected area should be filled in the white square frame. A little overpass is permitted but not too much.
- c) The selected area cannot be larger than the monitoring area.

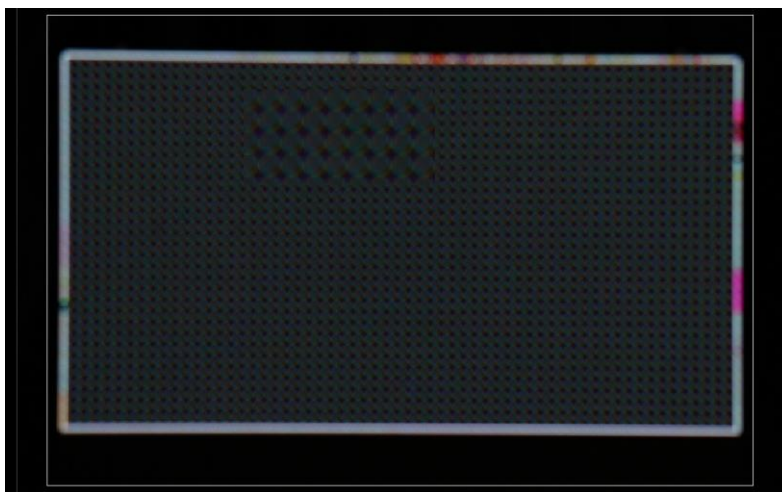


Fig.3-24

3.7 Camera adjustment

3.7.1 Auto adjustment

After camera preparation, click [Start Auto Adjust]. The program will automatically adjust camera params in a little while(usually 1~3mins).

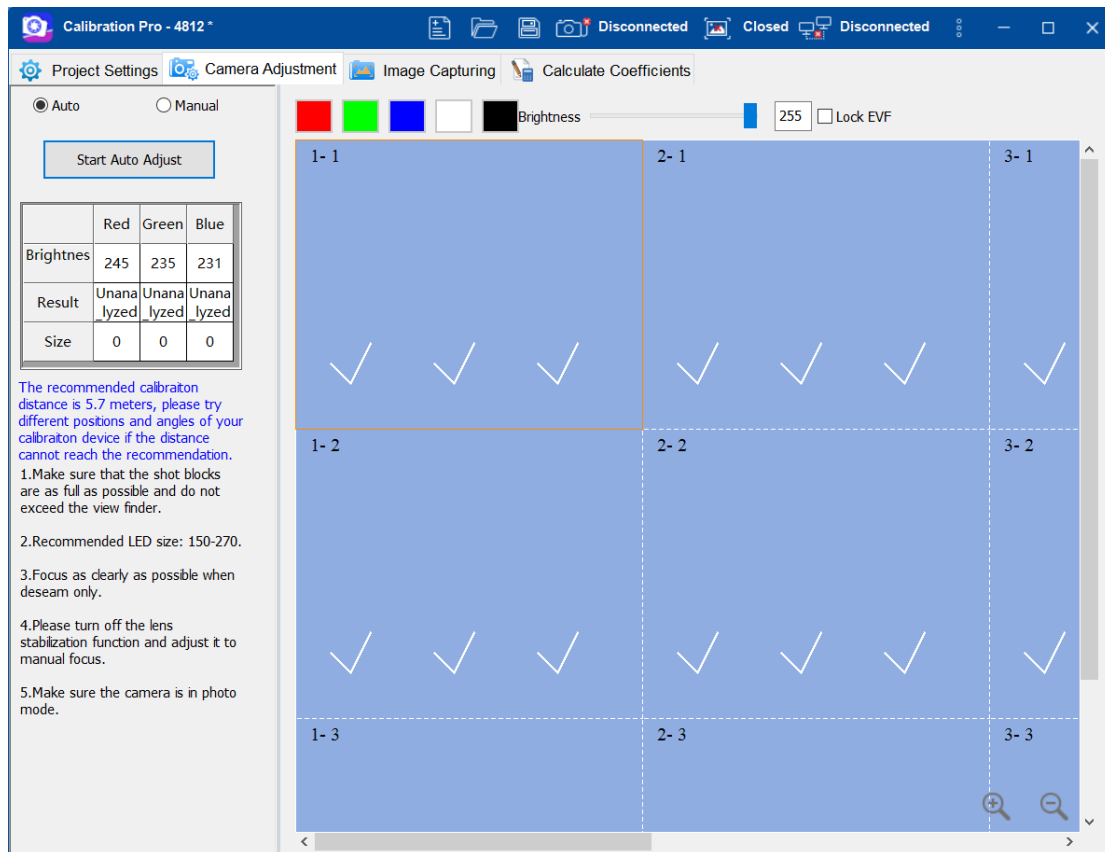


Fig.3-25 Auto adjustment

3.7.2 Manual adjustment

Switch to manual adjustment by clicking the radio button 'manual' .

NOTE: During the metering process, please notice two parts(as shown Fig. 3-26):

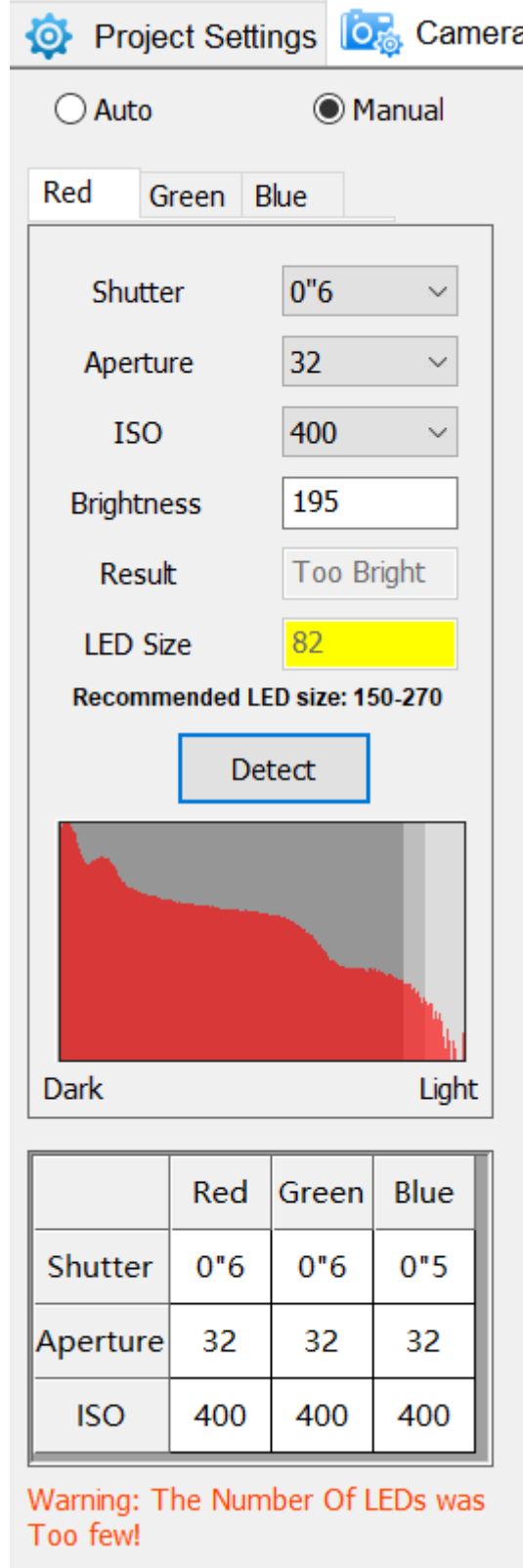


Fig. 3-26 Camera Adjustment

1) When validation result shows “ Normal” , and the lamp size is less than 150, it prompts with red font, orange yellow background in ①. When

it happens, please tune the aperture to make the real-time image blurred, then re-metering;

2) When the lamp size doesn't match the actual, it shows "Warning: the Number Of Lamps Does Not Match The Actual Number". With it happens, please check if there are too many dead lamp on the screen.

Automatic setting:

Click [**Setting All**] to detect red, green, blue automatically.

Manual Setting:

1. Click the [**detect**] button under red, green, blue, histogram generated from the image automatically taken by camera will be shown within the black square frame.
2. Check the histogram in preview frame to see shooting effect.
 - a) The standard histogram: the lower right corner of the corresponding color slope should be closed to the lower right corner of the square frame, staining to the right edge is not permitted.

b) Example in red:

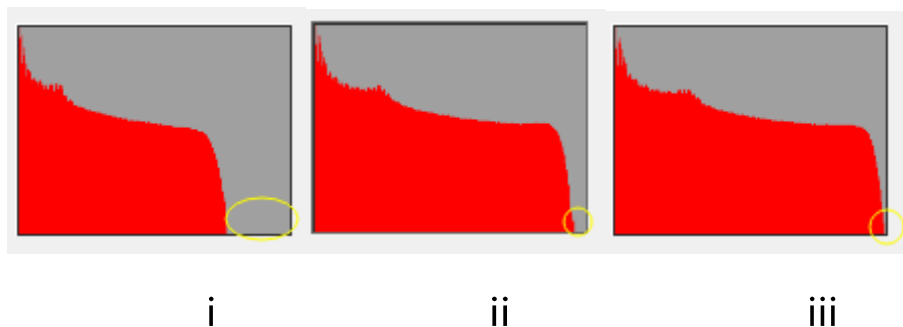


Fig. i too faint,

Fig. iii too bright,

Fig. ii standard

3. Adjust relevant parameters according to the above standards. Re-auto setting or manual setting can be made

if the picture can not meet requirements. Rules of manual settings listed as below:

- A) When too much bright
 - Reduce the shutter time (requires refresh rate increased)
 - Lower brightness percentage
 - B) When too faint
 - Increase the shutter time (requires environment improved)
 - Increase brightness percentage
4. Repeat step1-step3, to confirm picture histogram meet the requirements.

Note: Parameters change together with camera adjustment. Please save new setting parameters after the accomplishment of shutter adjustment.

3.8 Shooting photos part

1. Select one block from the [**Shooting photos**] in the partition map, then click [**Monitor**].
2. Adjust the camera to make the screen displayed area position in the preview area of the white box of Tab [**shooting photos**].
3. Click [**Batch Shoot**] in photograph page, the RGB matrix of the region was taken by each one (a few photos if skip points is enabled).
4. After shooting photo, the corresponding block area will display RGB matrix in the partition map. In the case of shooting failed, click [**Reshoot**] to reshoot the failed photo if enable the skip points function.
5. After shooting a selected block of RGB, the screen will automatically display the next block. Repeat step 2-4, to complete shooting photos for whole screen.

6. The calibrated object can be modified as [**Spare**] only when at least one block in the partition map of the conventional screen has accomplished analysis. Click [**Modify**]. In the pop-up [**Calibration Object Setting**] window, you can select [**Spare**], and the analysis file and photo file of the Spare object can be loaded automatically.

Note: If you set up [**Deseam Only**] in the [**basic parameters**] setting page, only need to shoot red color in each partition.

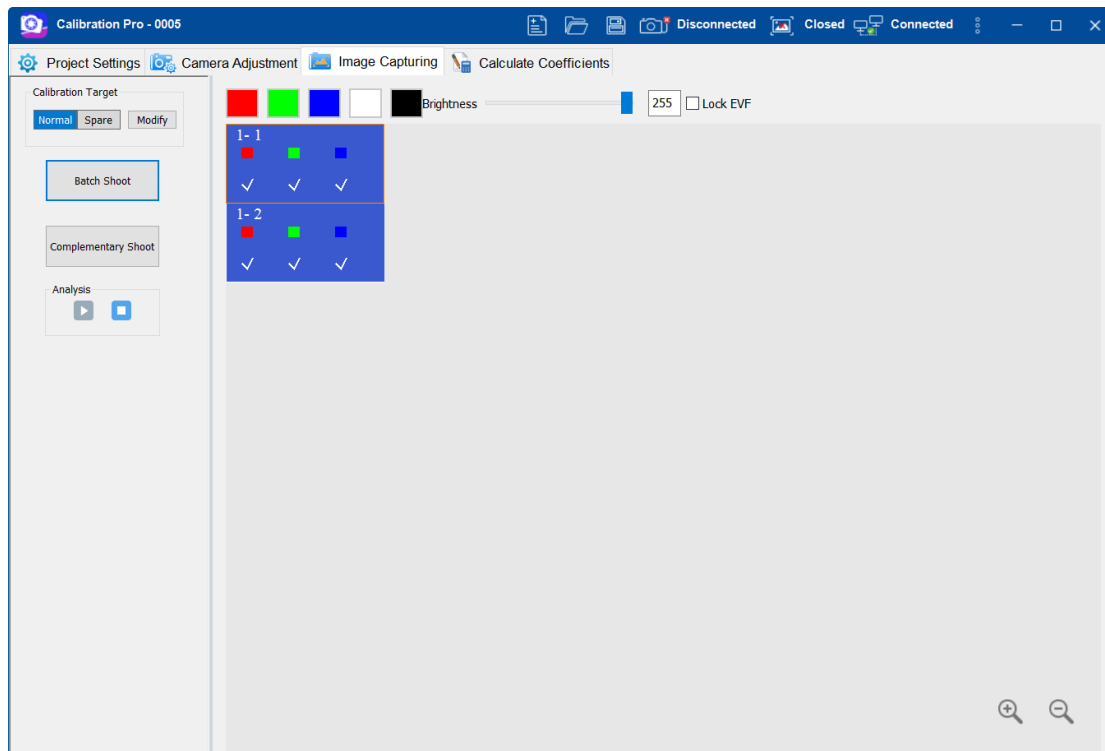


Fig.3-27 Shooting Photo

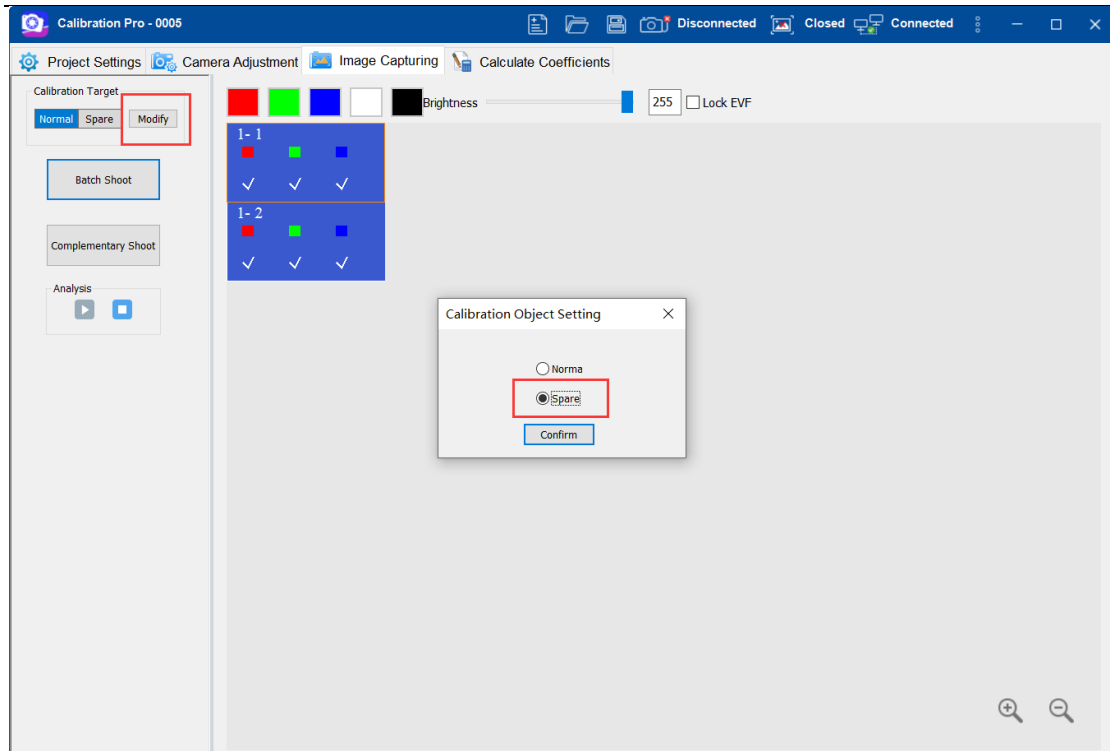


Fig.3-28 Switching to Spare

3.9 Generate coefficient

3.9.1 Brightness extraction

Start brightness extraction for images with clicking [**start analysis**] on [**shooting**] after shooting. (when completed the analysis of corresponding RGB images, a check mark will appear in corresponding area, as Fig. 3-29 shown).

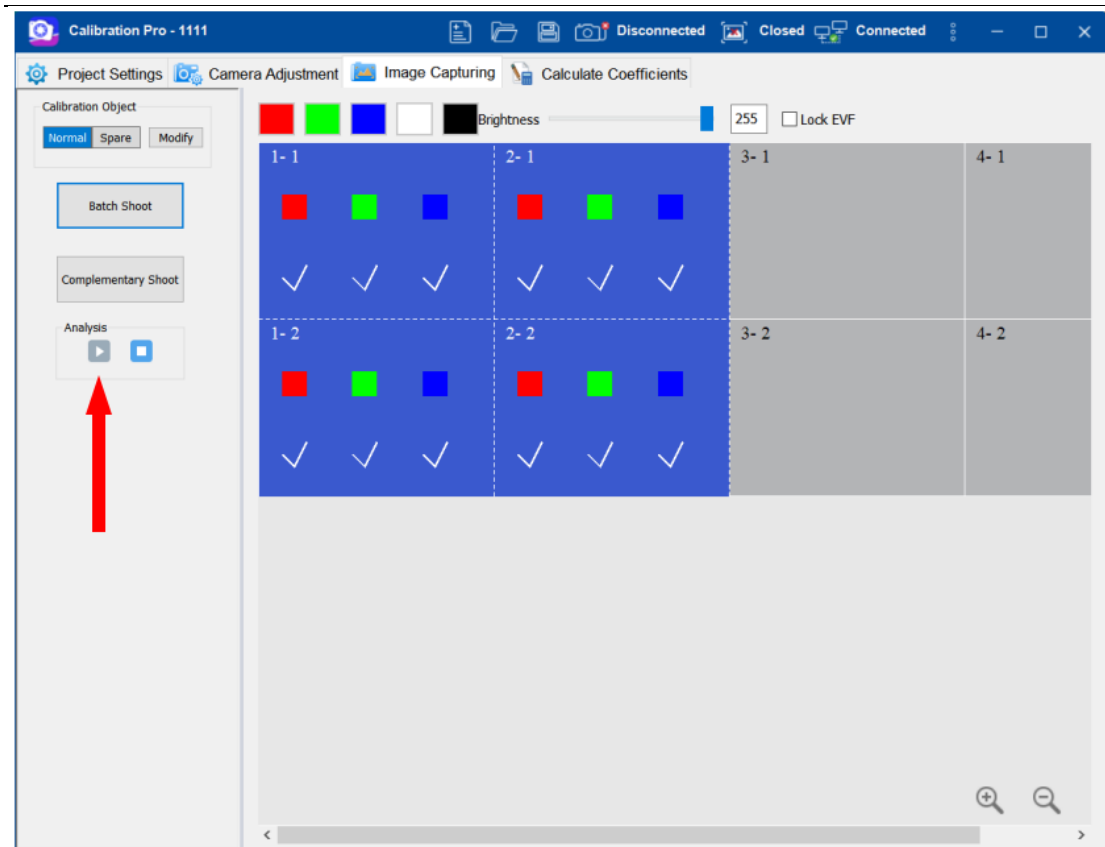


Fig. 3-29 Start Analysis

Analysis going with shooting can save lots of time if the computer has a good configuration.

3.9.2 Generate coefficient

1. The extracted brightness maps can be checked by selecting [**Coefficient**] → [**Brightness Chart**], as Fig.3-30 shown.
2. It will use Normal data When the [**Calibration Target**] was chosen by [**Normal**], and spare data by [**spare**].

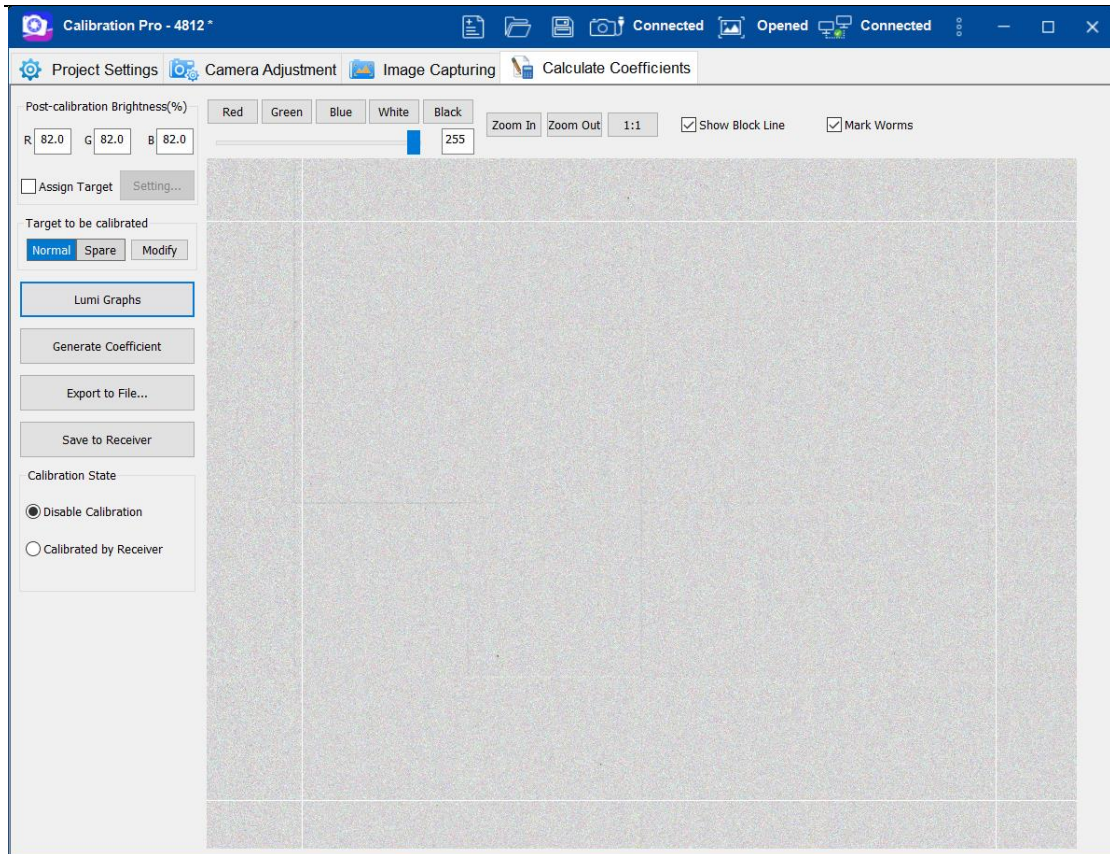


Fig. 3-30 Brightness Chart

3. [**Brightness(%)**]: Percentage of RGB means the retained brightness percentage after calibration (default value is 85).
4. A calibration coefficient will be created and saved in memory until the analysis of all images have been done (part of images that have been completely analyzed can be checked).
5. After generating integrated coefficient, send the calibration coefficient to the receiver card by clicking [**Save to Receiver**]. As the sending time is too long, please be patient and wait for the completion.
6. After saving the coefficient to receiver, click [**Calibration by Receiver Card**] to enable calibration. (please make sure all the receiver cards have been detected before saving)
7. After generating integrated coefficient, left click [**Export to File**] and select [**Export All**] to export coefficient into file .3fcoef or .9fcoef file.

- a. [**Export All**]: Export screen coefficient by calibration mode.
- b. [**Export by Sender**]: Export each sender`s coefficient by choosen [**Name By Coordinate**] or [**Name By Row and Column**] or [**Name By Index**].
- c. [**Export By Block**]: Export screen coefficient by split block size.

3.9.3 Eliminate Camera Dust And Worms

1. Eliminate Camera Dust: Chosen [**Eliminate Camera Dust Effect**] in [**Effect Setting**] as page 7.1 shown, click [**Lumi Graphs**] in [**Calculate Coefficients**], the software will automatically identify the camera dust and eliminate it. This option is checked by default.
2. Eliminate Worms: Chosen [**Mark Worms**] in [**Calculate Coefficients**], the software will automatically identify the worms and mark it, and emilinate the worms by Generate Coefficient. This option is not checked by default.
3. Manual Mark: After generating lumi graphs, right click the worms or camera dust area on the lumi graphs, choose option on the pop menu.
4. Introducing Pop Menu:
 - (1) Add Dirty: Take the mouse pint as the center and automatically select a rectangular border with 20x20 pixel. Trag the border to cover the camera dust area by mouse or use keyboard $\uparrow \downarrow \leftarrow \rightarrow$.
 - (2) Add worms: Take the mouse pint as the center and automatically select a rectangular border with 2 piixel width and module width as length. Default direction by automatically calculation.
 - (3) Worms Dirction: Manual set the dirction of the worms.
 - (4) Hide/Show Mark Border: Hide or show all of the marked border.
 - (5) Delete: Delete the selected border.
 - (6) Clear All Mark: Clear all the marked border.

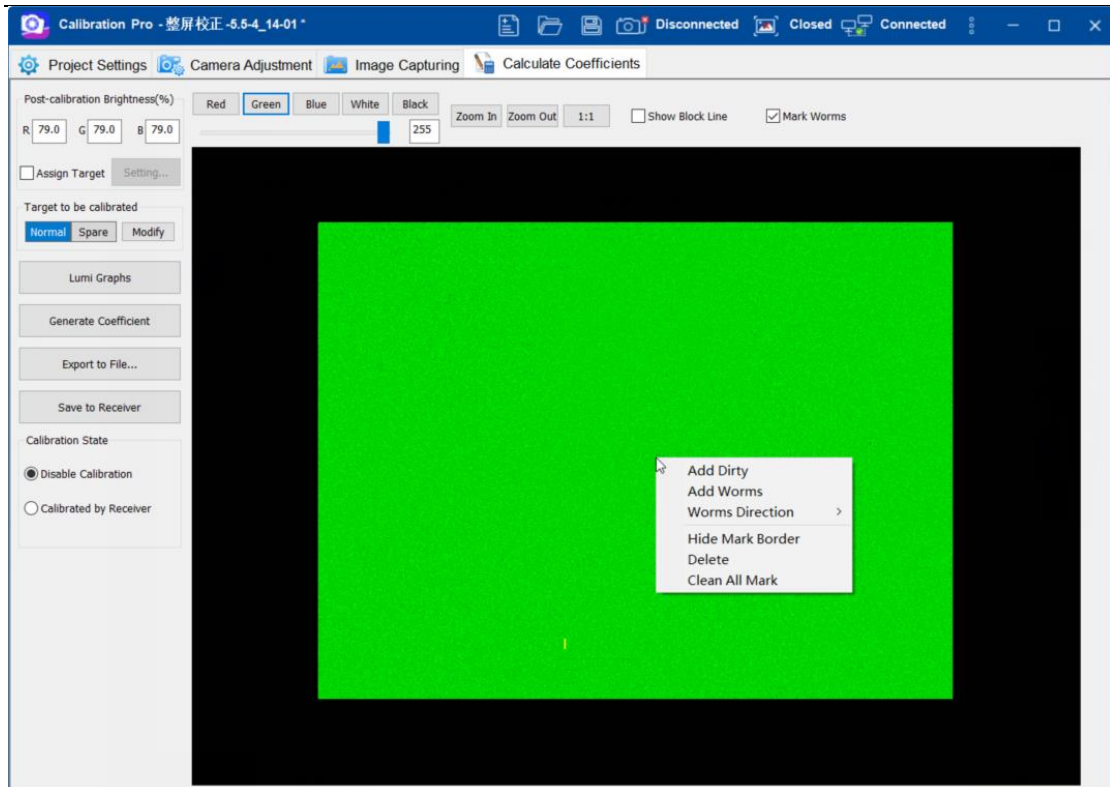



fig.3-31 manual mark worms and Camera dust

4. Single cabinet calibration

4.1 Create single cabinet calibration

Step 1/2/3:

Open the software, select the [ **New Cabinet**] to create a calibration (shown as Fig. 3-4). Input the project's name and click [next] to entry Cabinet project wizard-1.

The first three steps is same as integrated calibration. So let's introduce from step four.

Step 4: Cabinet project wizard-1

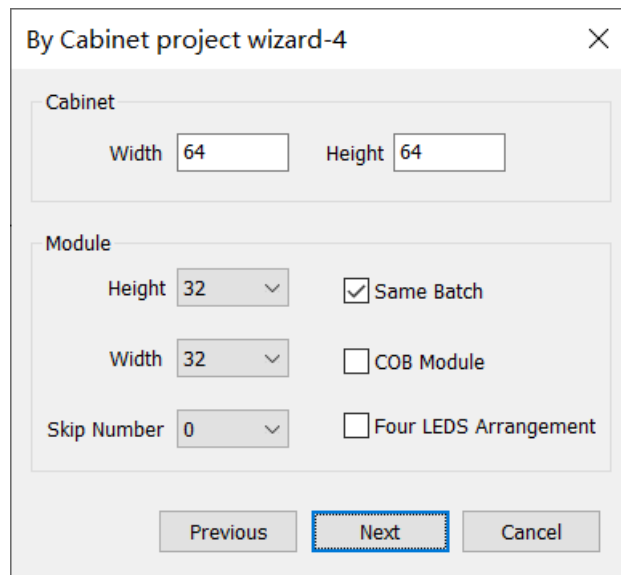


Fig. 4-1 Cabinet project wizard-4

Box project wizard-1 (Fig. 4-1), includes below settings:

“Box Width” , “Box Height” , “Module Width” , “Module Height” .

Jump Number will be auto calculated according to box width and height setting.

Same Batch: Check if all cabinets of the project are the same batch, otherwise uncheck it.

Step 5: Box project wizard-5

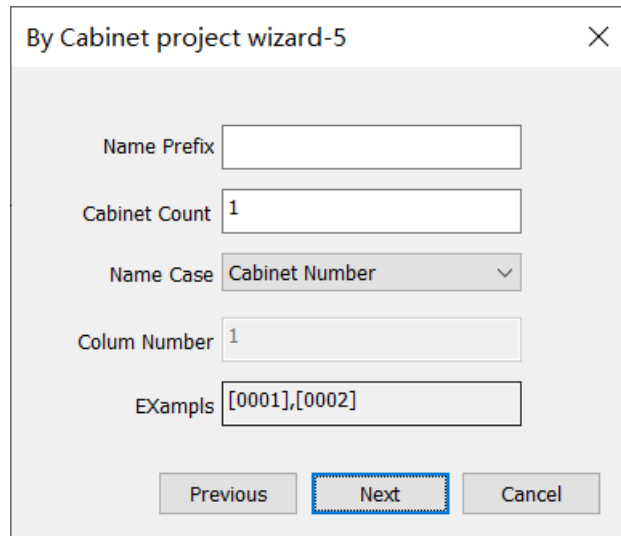


Fig. 4-2 Box project wizard-5

Box project wizard-2 includes below settings (Shown as Fig. 4-2):

Prefix: Project name.

Box count: Cabinet amount of the project.

Name Case: “Box Number” , “Row-Col” and “Col (ABC)-Row” , you can chose different naming methods.

Col Number: The number of columns of the screen, related to cabinet naming.

Example: Showing cabinet naming example according to user’ s “prefix” , “Name case” and “Col number” settings.

Same Batch: Check if all cabinets of the project are the same batch, otherwise uncheck it.

Module edge color cast: Check if see “cross” phenomenon on cabinet, otherwise uncheck it.

Step 6: Box project wizard-6

Same as integrated calibration, refer to Step 6 of 3.2.

4.2 Shooting process

4.2.1 Camera adjustment

Camera adjustment refers to section 3.6, 3.7.

4.2.2 Shooting

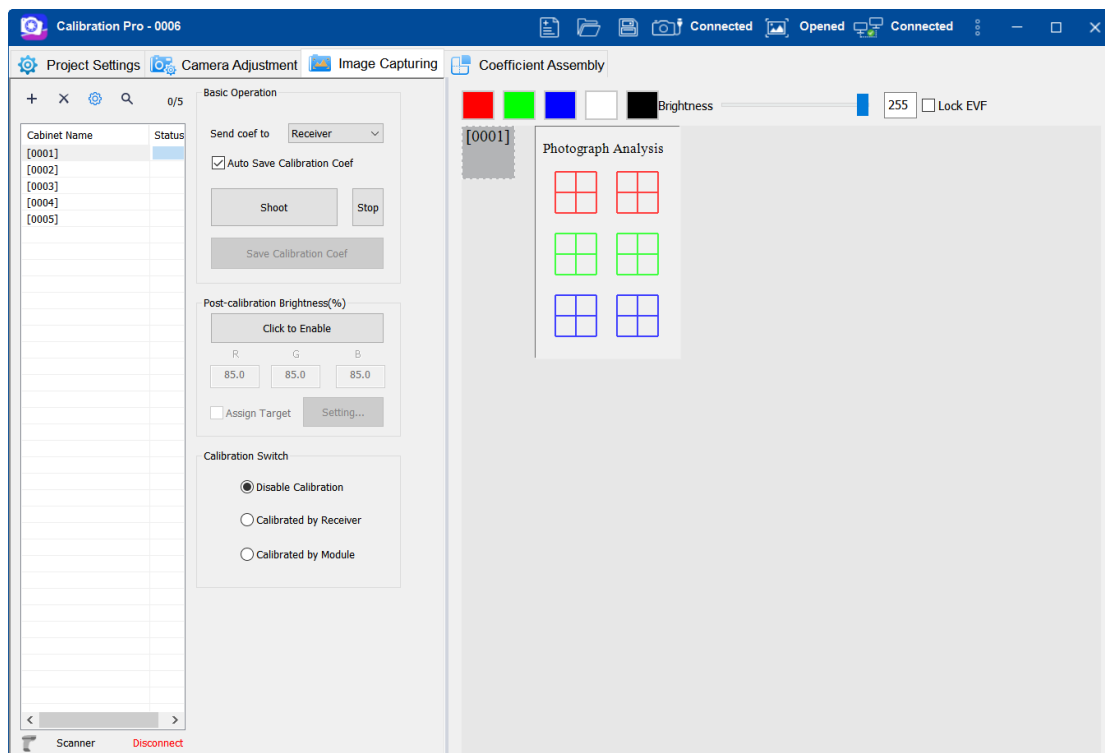


Fig. 4-3 single cabinet shooting

1. Click the [**Batch Shoot**] button, and start shooting from the first cabinet.
2. After analysis completed (Fig.4-4 ,when three colors present $\sqrt{\quad}$, it means that all the analysis are completed), the correct coefficient will be auto sent to receiver card (By default, the coefficient will be sent to receiver card automatically. Or, you may uncheck [**Auto Save Calibration Coef**] to disabled the function.).

3. After saving the calibration coefficient, it will pop up a dialog box. Calibration mode will be turned on automatically in i series mode, if in classic mode, you need to turn it on manually. Click [**OK**] on the dialog box, it will switch to next cabinet automatically, by switching to different colors, you can check calibration effect. as Fig.4-5 shown.

4. Mark the cabinet and then change to the next cabinet, repeat step 2 to 4 until all the cabinets are calibrated.

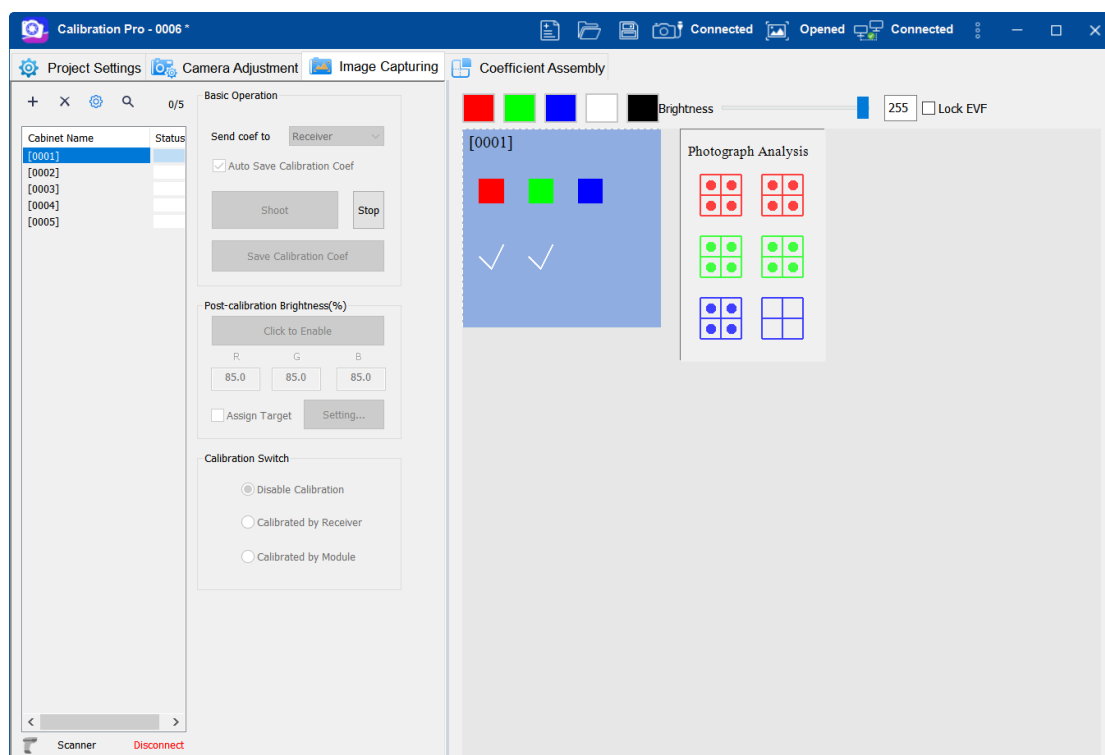


Fig.4-4 Analysing

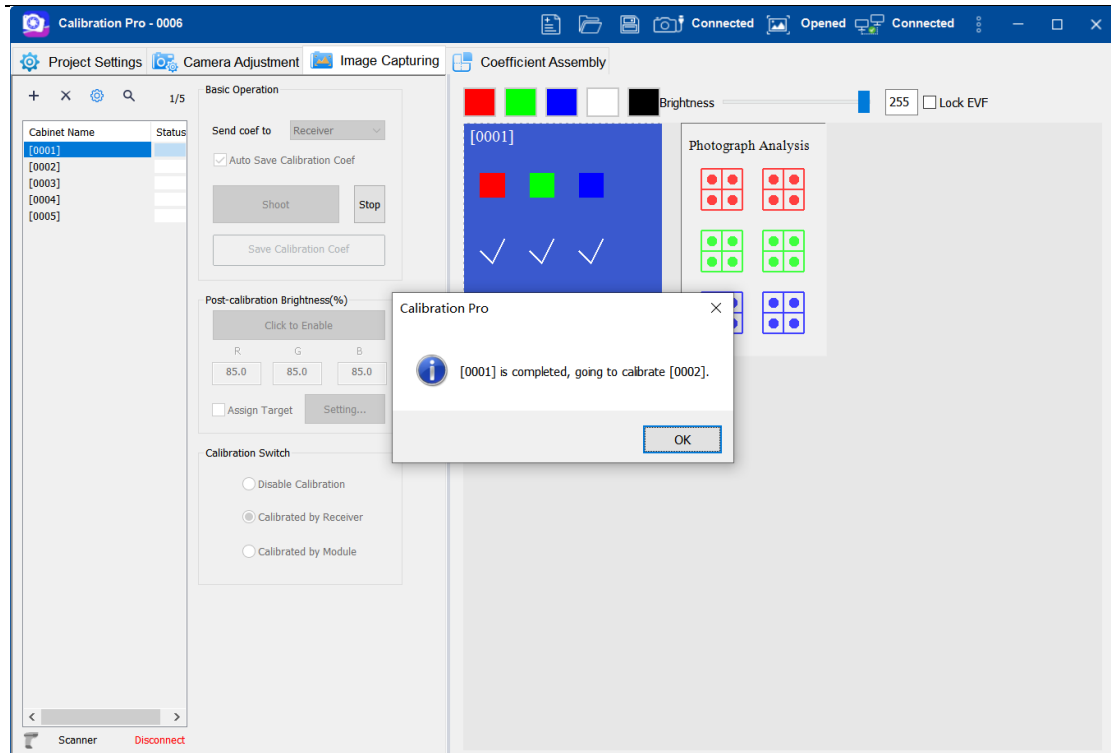


Fig.4-5 Finished

4.2.3 Reference model

The model file use to emilinate cross line, not checked by default. If checked the [**Use Model**] and select the model file, the cabinet of calibrated need send coefficient anew.

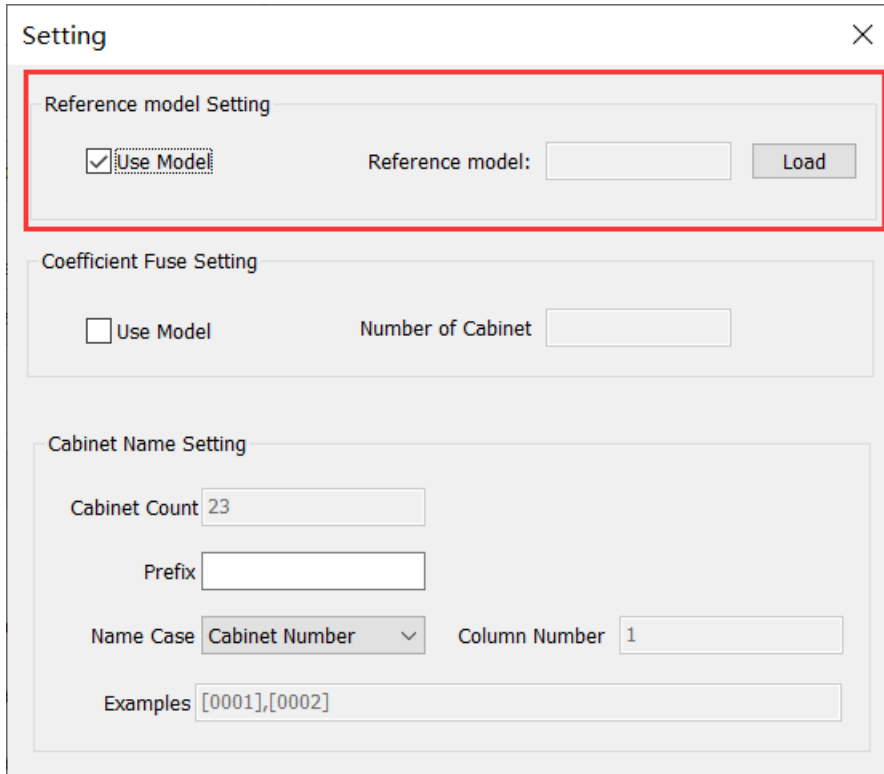


Fig.4-6 Reference Model setting

4.2.4 Coefficient Fusion

This option is use for solve the vignetting. Not checked by default.

Number of Cabinet: The number of cabinet is 8 by default. The fusion coefficient is not applied to the first n count, it is generated after finish the nth and apply to the subsequent cabinet, the first n count need to be send coefficient anew.

Notice: Change number of cabinet will generate fusion coefficient anew and the calibrated cabinet need to be send coefficient anew.

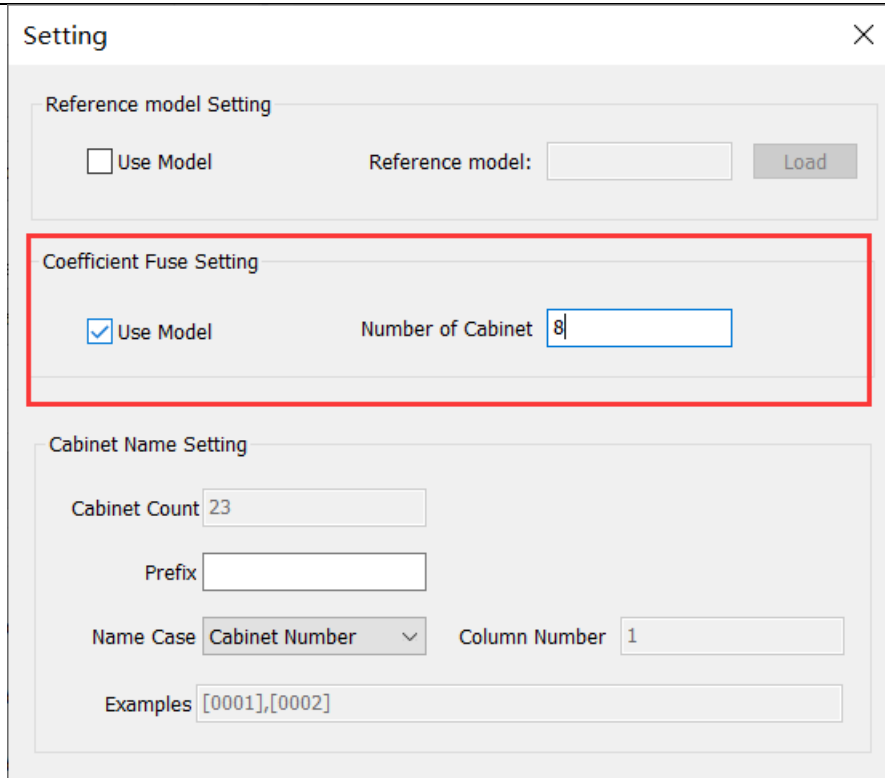


Fig.4-7 Coefficient Fuseion Setting

4.2.5 Calibration Log

The calibration log will log the process and excetion during calibrating in the cabinet project.

- 1.Plan Cabinet: Is same as the number of cabinet list.
- 2.Remain Cabinet: Plan Cabinet – Calibrated Cabinet.
- 3.Exception: The number of cabinet that unable calibration.
- 4.All: Display all process and exception.
- 5.Data: Display data for the specified date.
- 6.Process: Display all records that cabinet has finished or add cabinet or delete cabinet or cabinet name changed.
- 7.Exception: Display all records that param has changed.

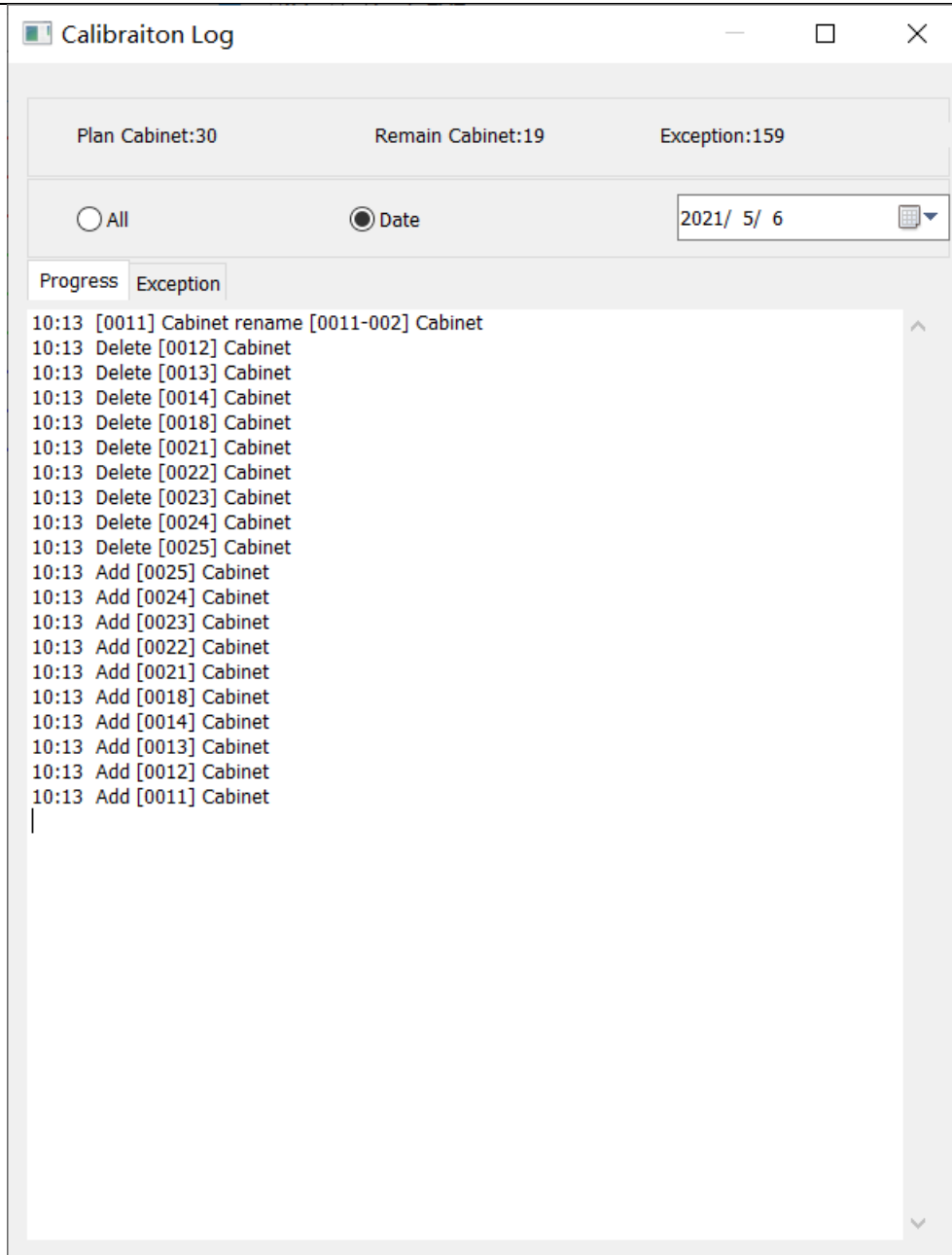


Fig.4-8 Calibration Log

5. Details of Sub-screen Calibration Operation

5.1 Create a sub-screen calibration project

The process of creating a sub-screen calibration project is basically the same as that of creating a whole screen one. See Section 3.2.

5.2 Set the sub-screen calibration project

After creating a project, enter the main interface of the software, and click [**Subscreen Set**] in the upper right corner of the interface to enter the sub-screen setting window. When you enter the window for the first time, you need to choose a sub-screen calibration mode between [**Subscreen By One Sender**] and [**Subscreen By Multi Send**], as shown in Fig. 5-2.

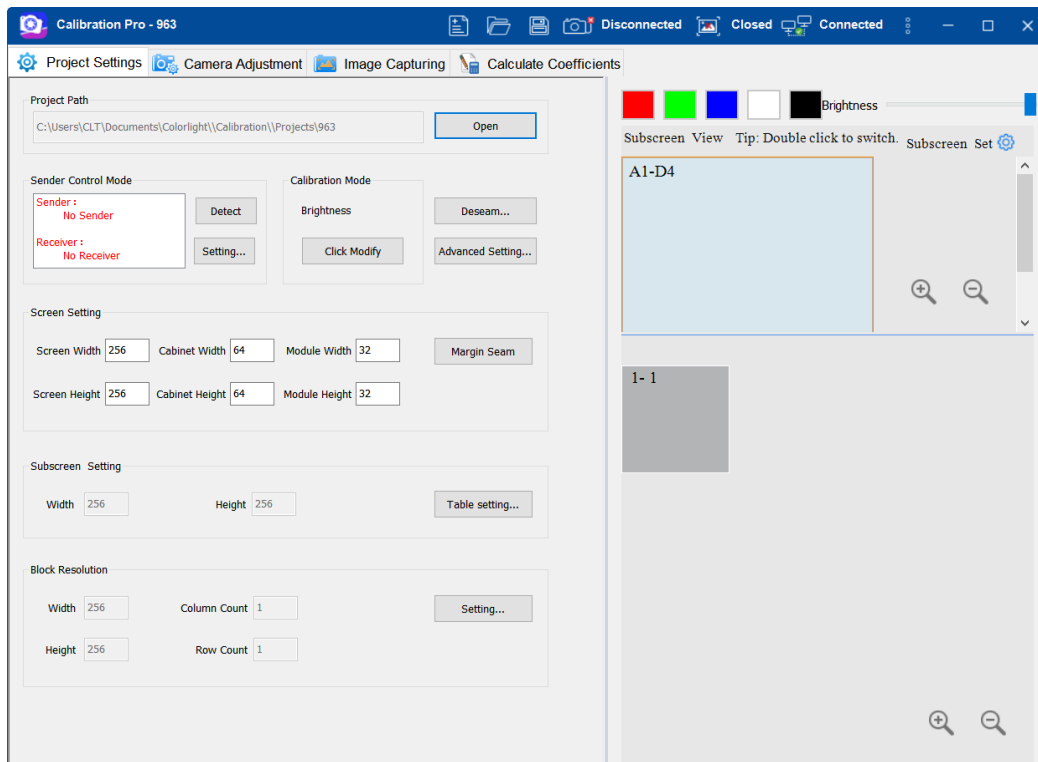


Fig.5-1 Sub-screen project settings page

or lick to delete the selected cabinet, as shown in Fig.5-4.

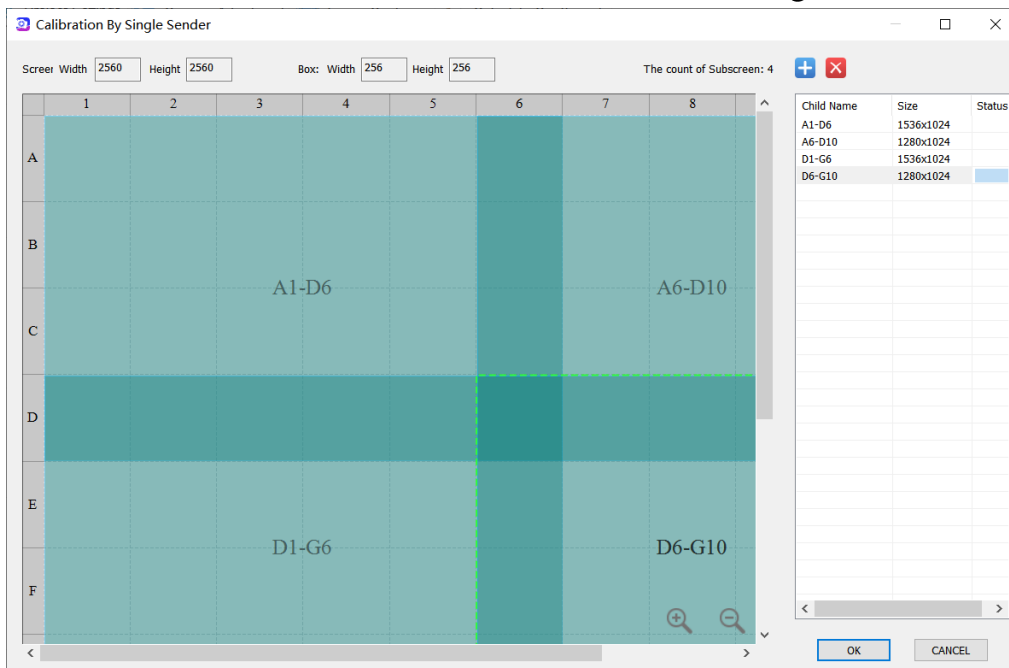


Fig.5-4 Calibration By Single Sender setting window

After adding all the sub-screens according to the actual loading situation of the sender, click **[OK]** to return to the main interface, as shown in Fig.5-5. You can perform integrated calibration on every sub-screen (See Chapter 3).

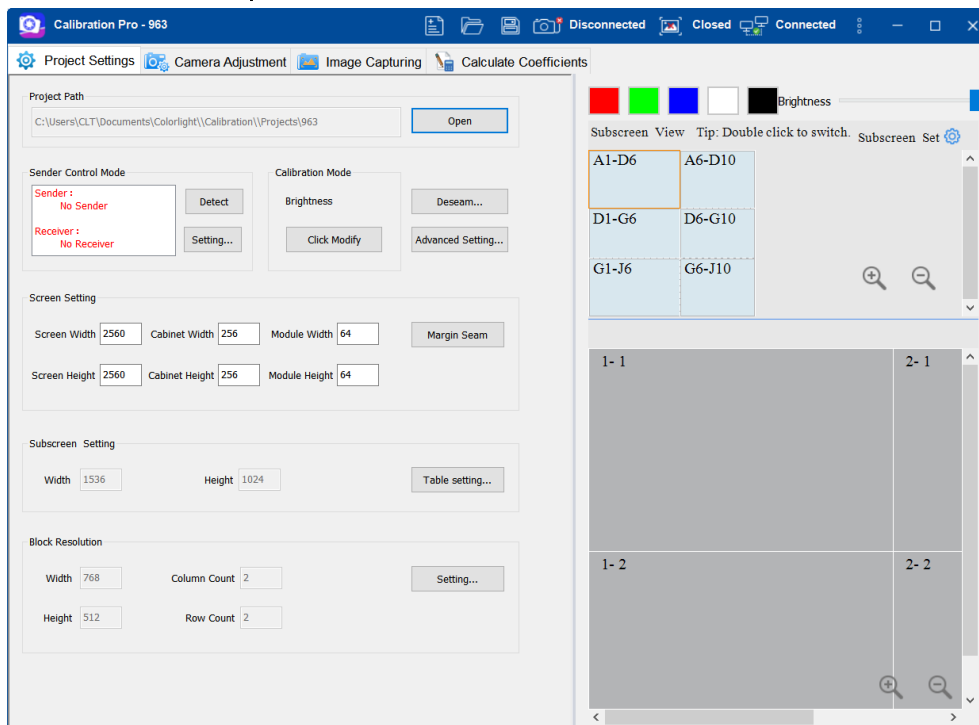


Fig.5-5 Main interface of Subscreen By One Sender

5.2.2 Subscreen By Multi Senders Project Settings

If the whole screen connects to more than 15 senders, you can choose the [**Subscreen By Multi Send**] mode to perform calibration, and then click [**OK**].

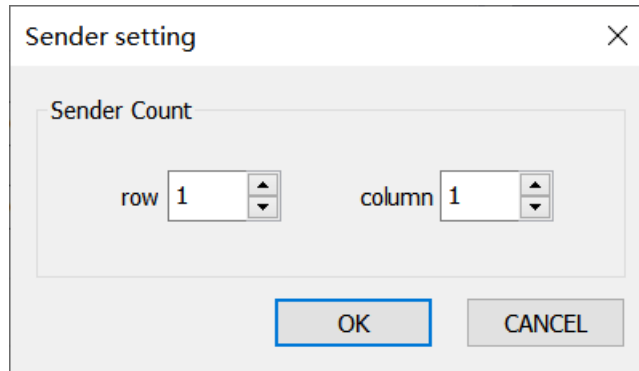


Fig.5-6 Sender setting

In the [**Sender setting**] dialog box, as show in Fig.5-6, set the number of senders connected to the whole screen according to the actual situation. After setting, click [**OK**] to enter the [**Calibration By Multiple Senders**] window, as shown in Fig.5-7.

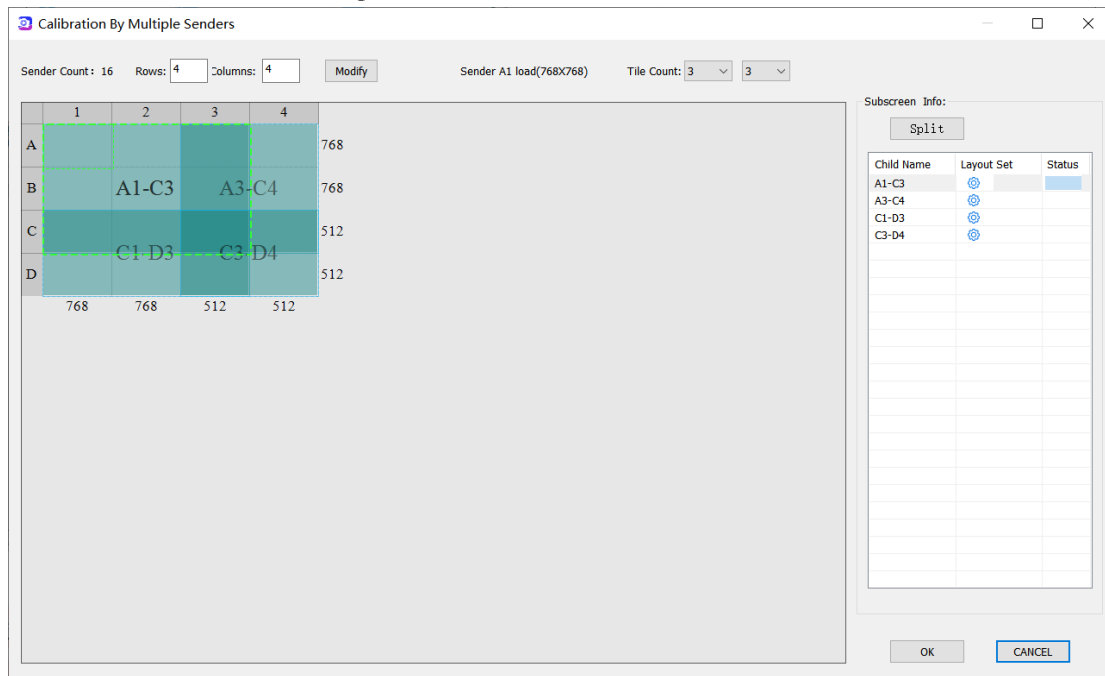


Fig.5-7 Calibration By Multiple Senders setting window

Sender Count, Row, Column: You can modify the value according to the actual loading situation, and then click [**Modify**].

Sender load Tile Count: Record the size of the selected sender. The value of loading capacity of the sender is a multiple of cabinet resolution, and you can modify the value according to the actual loading capacity of the sender.

After setting the sender count and loading capacity, you can split the screen. Click [**Split**], and set the number of sub-screens, as shown in

Fig.5-8.

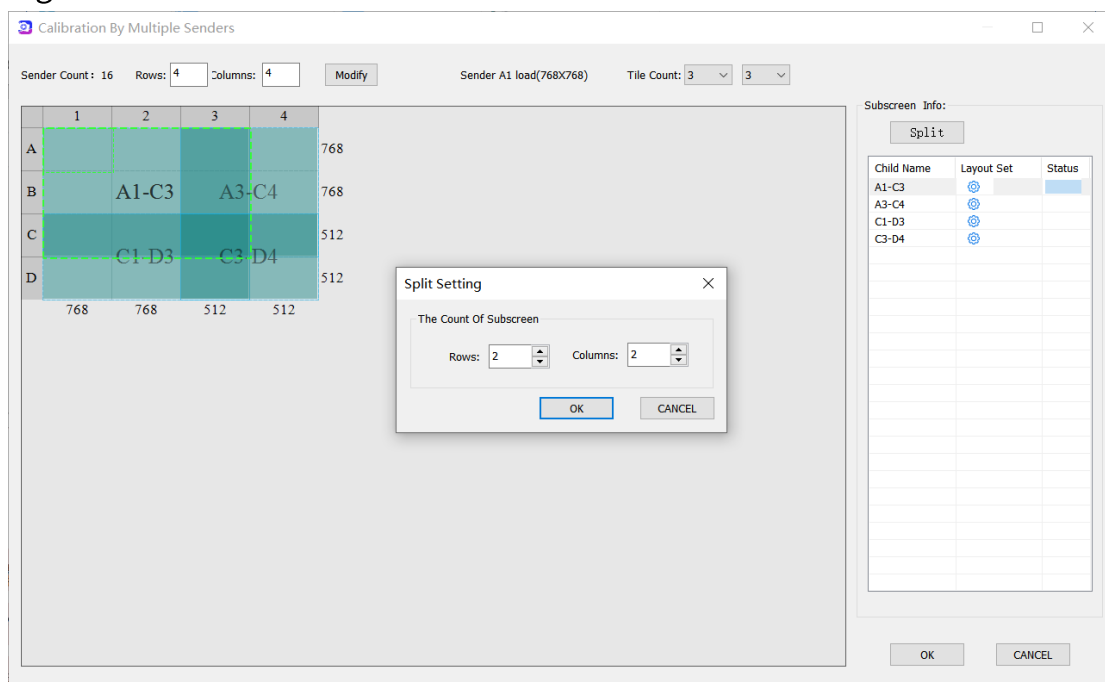


Fig.5-8 Split setting

Generally, the sub-screen number does not exceed the sender number, and you need to ensure that the number of the senders connected to a single sub-screen does not exceed 15. After setting the number of sub-screens, click [**OK**], and the software will automatically compute the size of the sub-screen. You can select the sub-screen and drag the frame to change its size. The result of splitting is as shown in Fig.5-9.

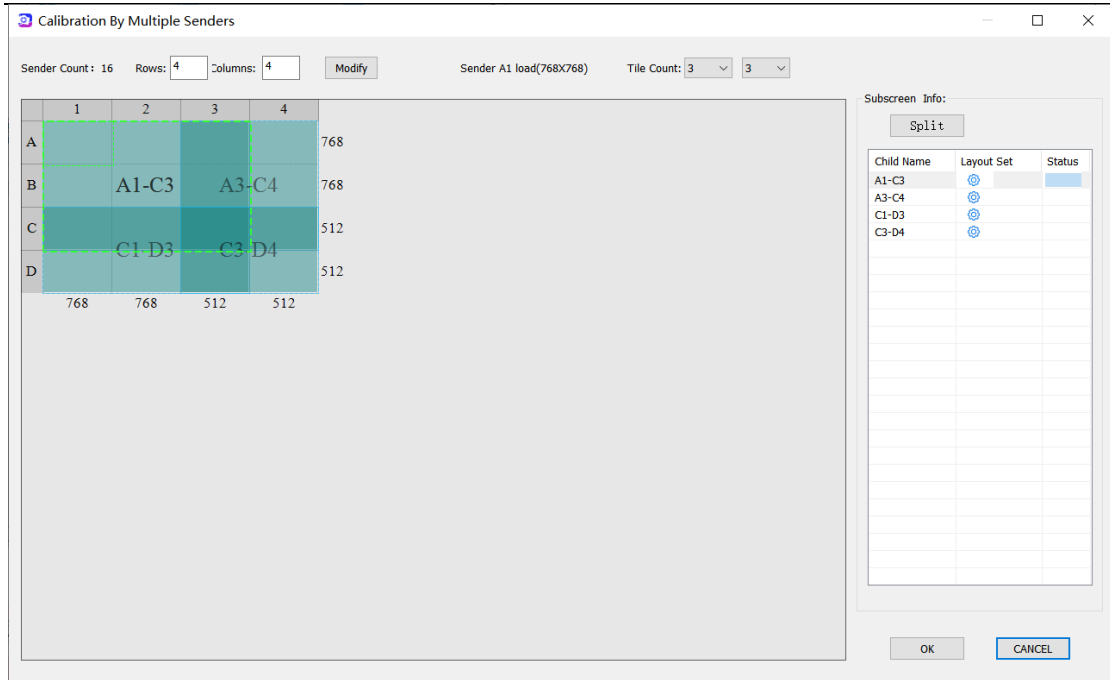



Fig.5-9 Subscreen By Multi Senders window

You can click  in the sub-screen list on the right side of the window to set sender mapping according to the actual layout of senders.

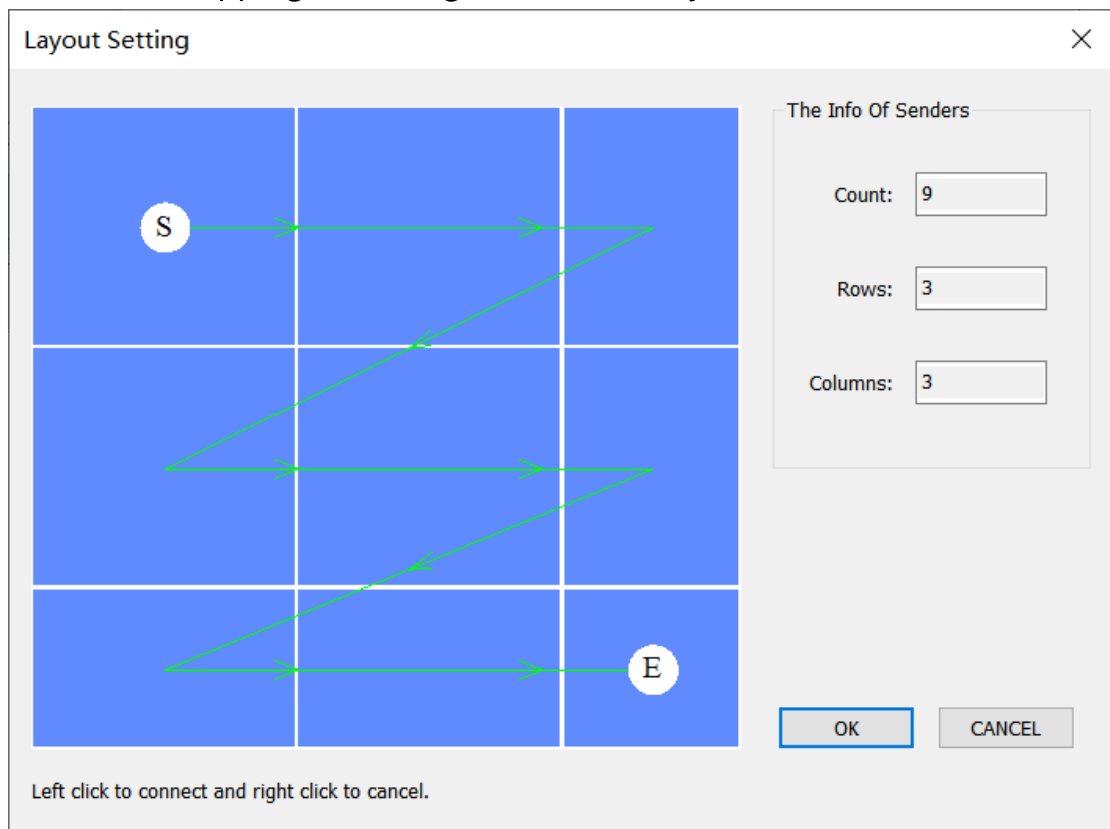




Fig.5-10 Sender layout settings

After setting all sub-screens, click **[OK]**, and exit the **[Calibration By Multiple Senders]** window. And the calibration process of all sub-screens is completed.

When the shooting and analysis of the blocks in the first sub-screen are completed, and the brightness graphs and coefficients have been generated, double-click the left button on the mouse on the **[Project Settings]** page to switch sub-screens. In the pop-up dialog box asking **“Has the Subscreen be calibrated?”** , click **Yes**, and the background color of the sub-screen will turn blue, which means the sub-screen has been calibrated, and the parameter locking button  will appear in the upper-right corner of the window. On the **[Project Settings]** page, the **[Calibration Mode]**, **[Deseam]**, **[Advanced Setting]**, **[Margin Seam]** and **[Screen Setting]** items are locked. If you want to modify the locked parameters, you can click  again. After modifying the locked parameters, the calibration status of sub-screens will be reset.

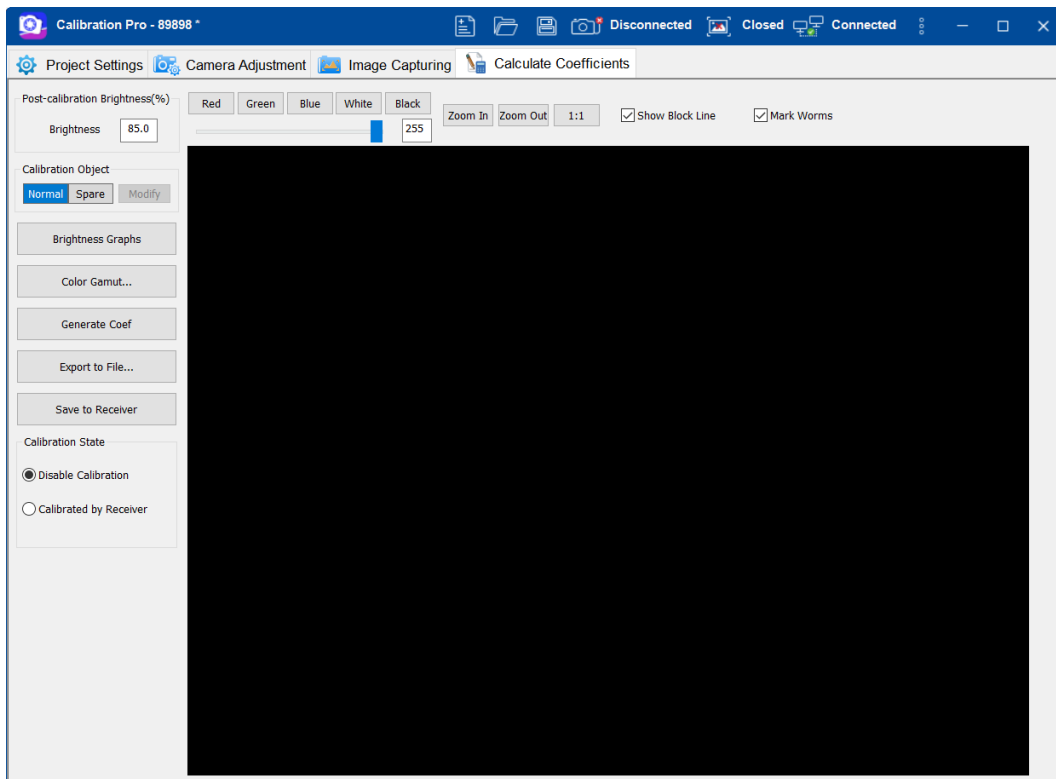


Fig.5-11 Calculate Coefficients

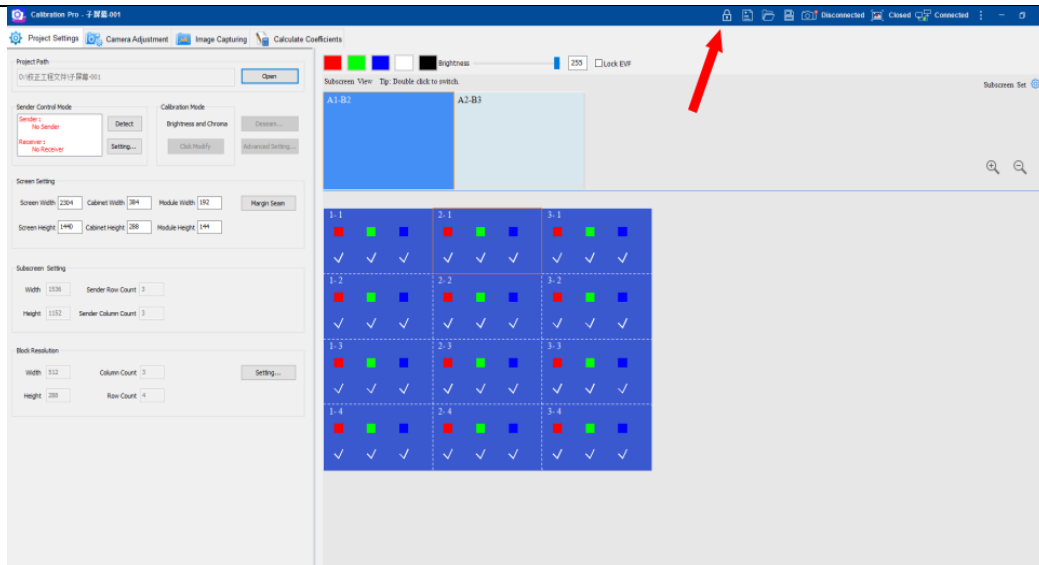


Fig.5-12 Parameter locking

6. Deseam Setting

6.1 Fuction Intrudction

Deseam is to minimize the physical seam between cabinets(or modules). After shot the screen and analyzed the photos, the software will automatically adjust the luminance of the pixels on the edge to benefit the display effect of LED screen.

6.2 Enable deseam

To deseam your screen, you should:

- 1.Show the deseam setting dialog by selecting [**Basic**] → [**Desam...**].
- 2.Check the [Enable] button to enable deseam.
- 3.Input the width and height of tile/module.

6.3 Deseam factor

‘Deseam factor’ is the adjustment range of deseam. 1 is the recommended value. If you get a poor effect after deseam, you may adjust the factor to change the effect. If a dark line (or bright line) is still too dark (or too bright) after deseam, you should increase the factor; On the opposite, if a dark line (or bright line) is too bright (or too dark) after deseam, you should decrease it.

6.4 Deseam only

You may check the [Deseam only] button only if you just need deseam and don’ t need brightness/chromaticity Calibration. In deseam only mode, you should focus the camera on a clear focus, and only green color will be shot.

6.5 Eliminate difference

Check the [Eliminate difference] to enable eliminate difference.

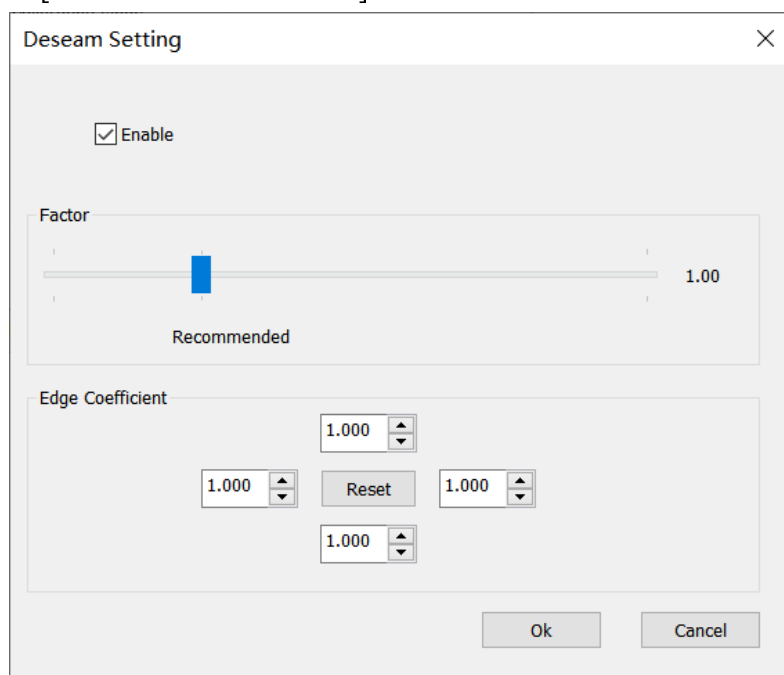


Fig.6-1 Deseam Setting

The interface of deseam setting is shown in Fig.6-1.

7. Effect Setting

7.1 Effect setting overview

Effect setting is used for adjusting calibration effect and fixing screen flaws after calibration. The effect options will vary with your selections (**Same Batch, COB Module**) in the **Whole Screen project wizard-4** dialog box. There is an effect description appearing below every option. If you select the **Same Batch** check box and clear the **COB Module** check box, the advanced setting dialog box is as shown in Fig.7-1.

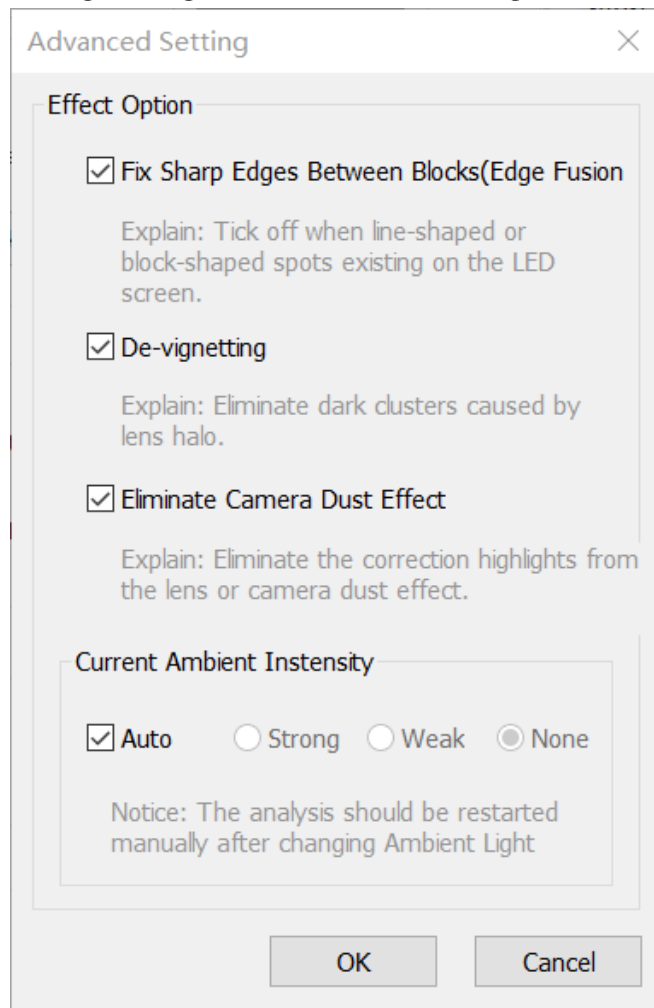


Fig. 7-1 Effect Setting-1

The **Insure Replaceability**, **Eliminate Vignette**, **Eliminate Dirt** and **Auto** check box is selected by default.

If you clear the **Same Batch** check box and the **COB Module** check box, the advanced setting dialog box is as shown in Fig.7-2.

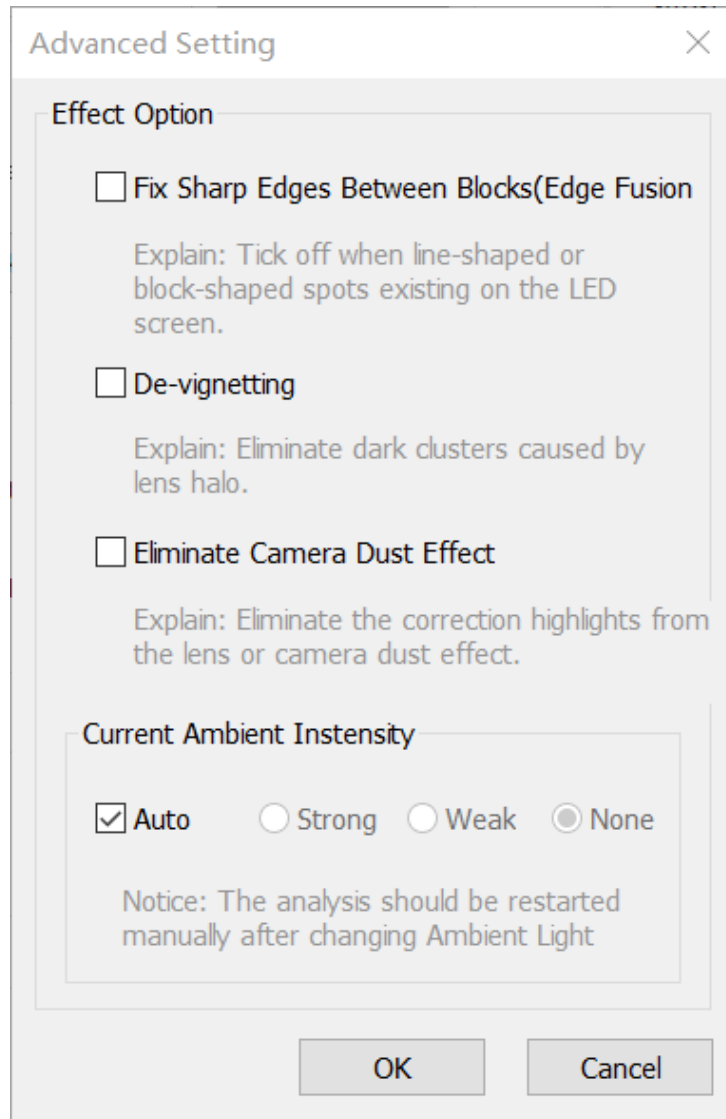


Fig. 7-2 Effect Setting-2

If you select the **COB Module** check box, the advanced setting dialog box is as shown in Fig.7-3.

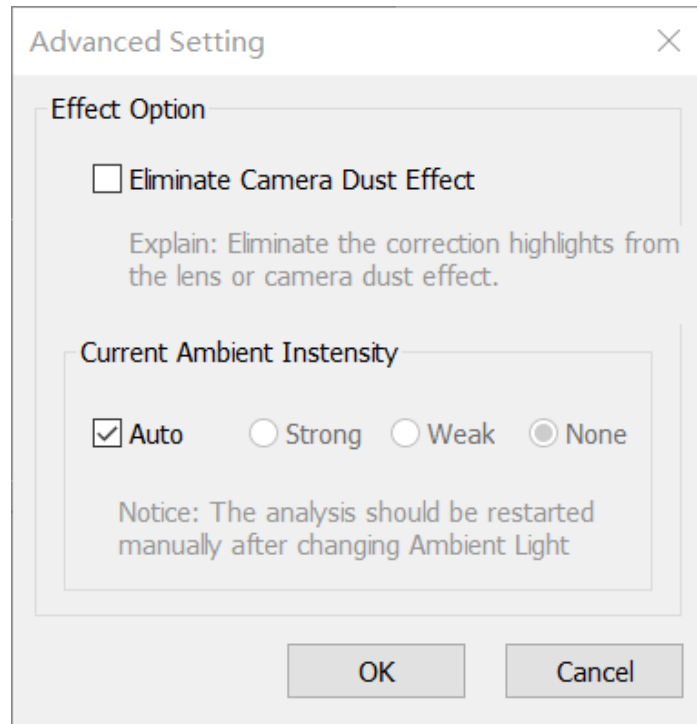


Fig. 7-3Effect Setting-3

7.2 Turn on “Eliminate Differ”

“Eliminate Differ” option will eliminate the discrepancy between different calibrated blocks.

This option will take effect after generating a new “Brightness Chart” under “Coefficients” page.

7.3 Eliminate vignette

“Eliminate Vignette” will eliminate dark clusters caused by lens halo.

This option will take effect after new analysis of shoots.

7.4 Eliminate dirt

“Eliminate Dirt” will eliminate the bright spot caused by dirt on lens or body of camera after calibration.

This option will take effect after new analysis of shoots.

7.5 Ambient light

The ambient light can be automatically identified by default. Or you can clear the Auto check box, and select [**Strong**] or [**Weak**] according to the actual ambient light to effectively prevent the interference of ambient light.

After modifying the item, you need to perform the analysis again.

7.6 Eliminate Colored Moire

“Eliminate Colored Moire” will eliminate the colored moire caused by correction acquisition.

After modifying the item, you need to perform the analysis again.

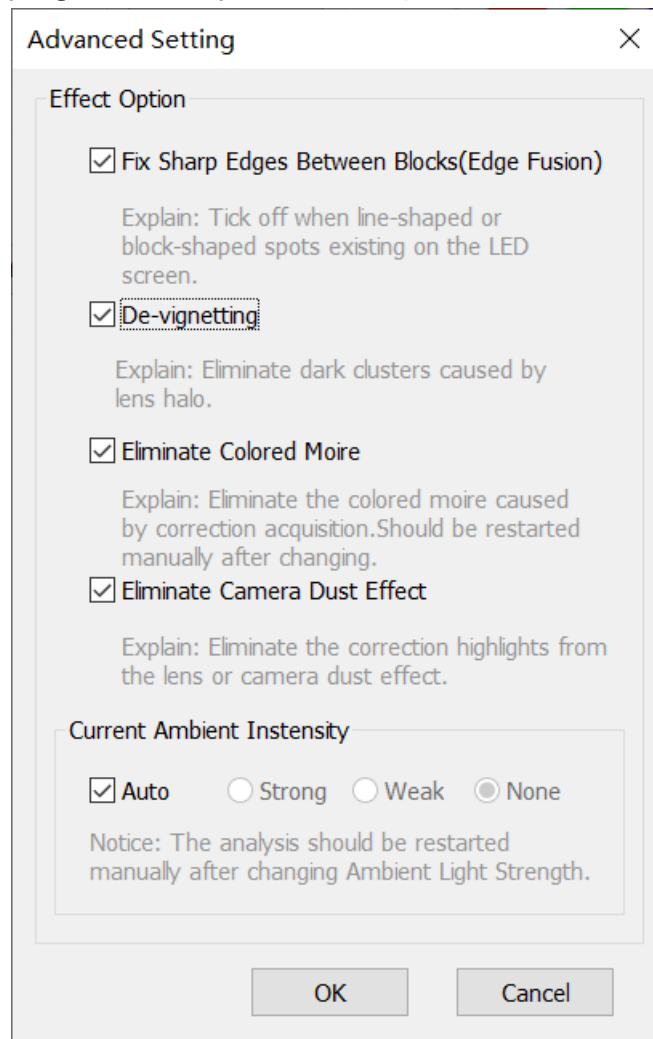


Fig. 7-4 Effect Setting-4

8. Brightness and Chroma calibration

1. Select [**Brightness and Chroma**] as calibration type in [**coefficient**] page. As shown in Fig.8-1.

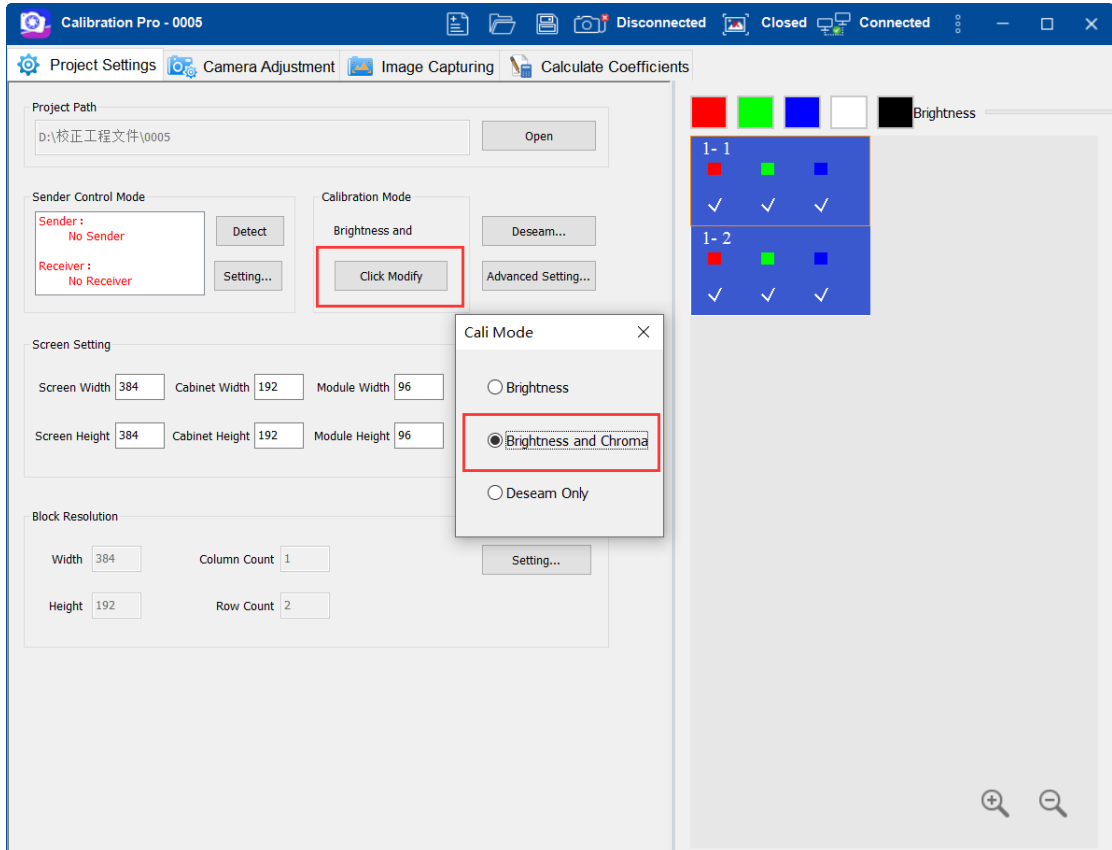


Fig.8-1 Select “Brightness and Chroma” Calibration

2. 1)Switch to [Coefficients] page.
2)Click [Brightness Chart]. Skip this step if it’ s a cabinet calibration.
3)Click [Color Gamut..], which shown as Fig. xxxx & Fig. xxxxx.

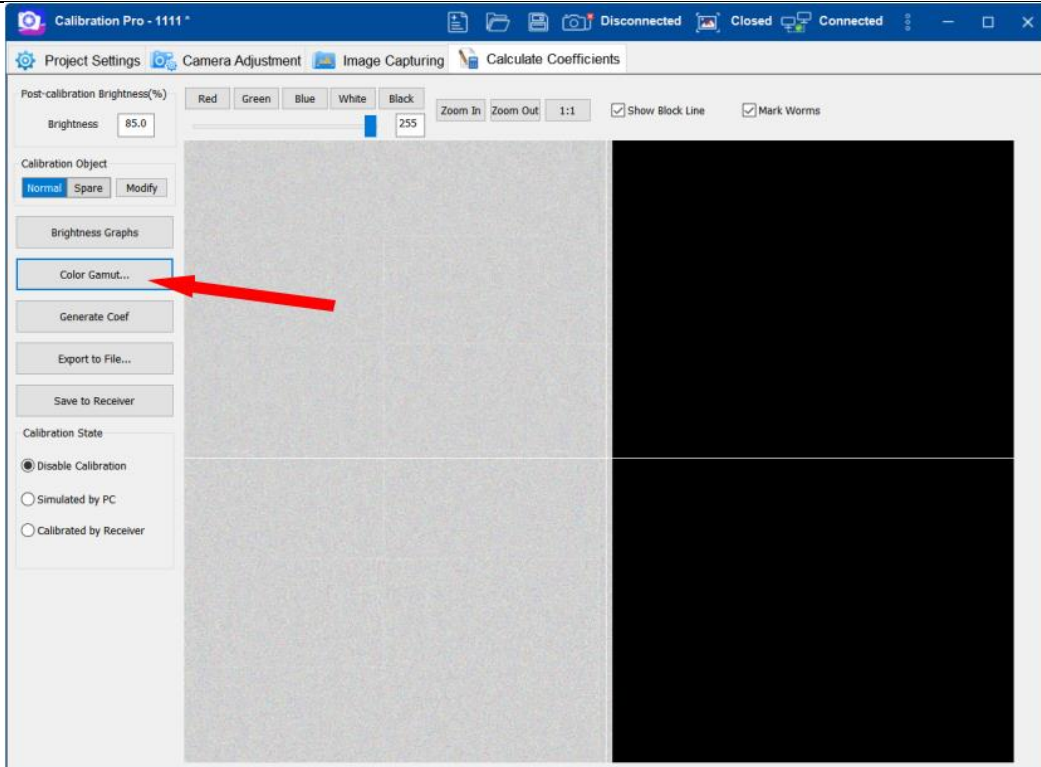


Fig.8-2 Setting entrance of whole screen calibration

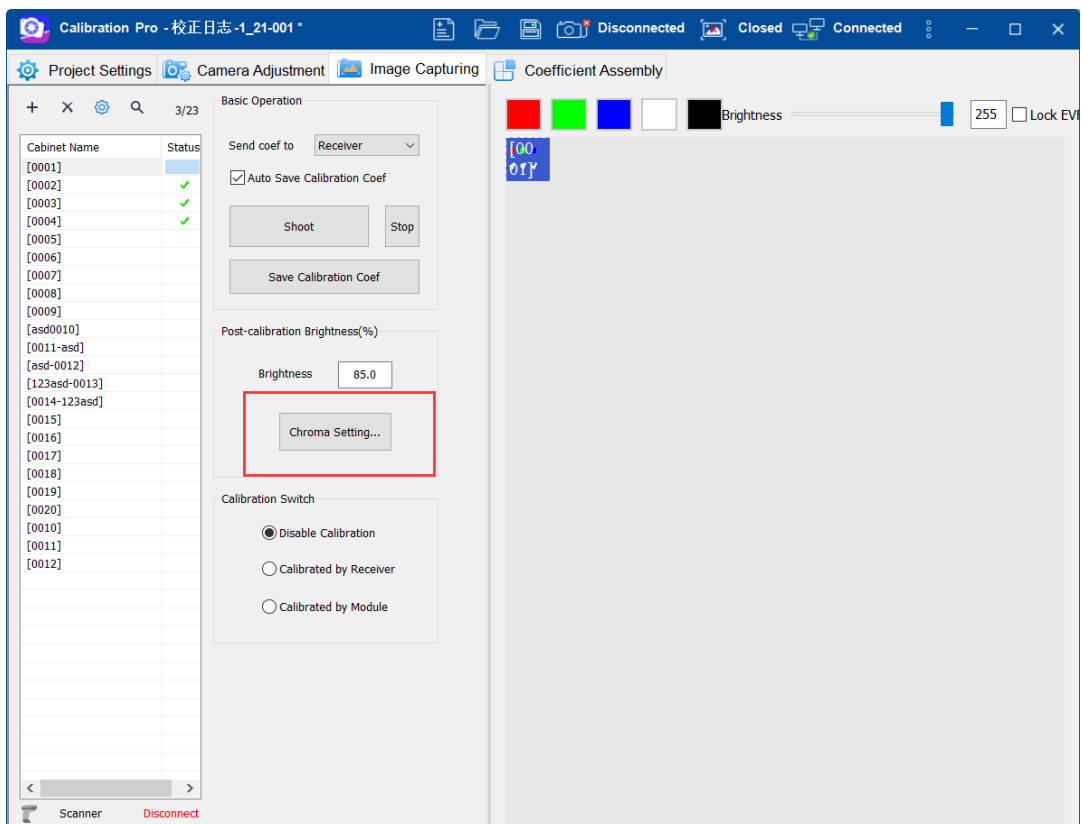


Fig.8-3 Setting entrance of single cabinet color gamut

3. Color gamut setting

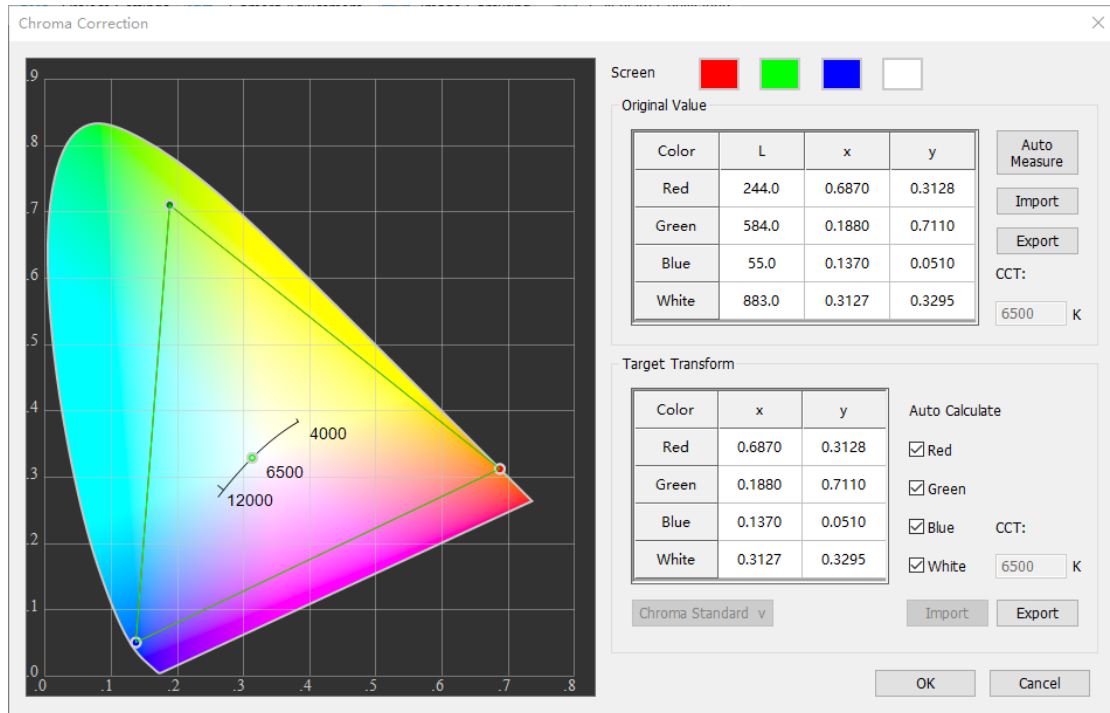


Fig.8-4color gamut setting

a) With the chromemeter, select [**Auto Measure**], then input the brightness and chroma data manually before calibration. Without the equipment, just skip to c).

b) After automatic measurement , collect the white data to verify.

c) Color gamut:

We recommend checking [red] [green] [blue] of [**Auto Calculate**], it can calibrate the different chroma under the retain gamut in maximum and reduce chroma loss.

Please uncheck [red] [green] [blue] of [**Auto Calculate**] and input the coordinate of target color manually or drag the point in Chromaticity diagrams if the users have special requirements for color gamut.

Built in sRGB, AdobeRGB, PAL, NTSC, Rec.601, Rec.709, Rec.2020, DCI-P3 color coordinate parameters.

d) White balance:

We recommend checking [**white**] of [**Auto Calculate**], the built-in algorithm will keep the white point coordinates before calibration.

Please uncheck [**white**] of [**Auto Calculate**] and input the coordinate of target white point manually if the users have special requirements for white balance.

Built in D65 color coordinate parameters.

e) Color temperature:

If you need to change the color temperature, you can uncheck [**white**] of [**Auto Calculate**], then input the target color temperature, built-in algorithms will automatically calculate the color coordinates.

f) Approx value:

when the target color gamut over the original color gamut, you can click [Approx value], algorithms will automatically calculate and limit the exceeded part in the nearest original color gamut.

9. Suggestion on calibration

1. Shift the camera to **M mode**.
2. Gray scale and brightness can not be modified at random while shooting. Because changes will have impacts on RGB color photos;
3. Calibration is suggested to take at night, a better brightness uniformity is the key point.
4. Calibration can make a better uniformity but a reduction on brightness
5. After calibration, view from front is the best, viewing angle and viewing effect from side can not be improved.

10. FAQ

Q: Failed to detect receiver card.

- A: 1. Ensure the stable connection between hardwares.
2. Improve the frame time.
 3. Select the right net card under the drop down list.

Q: Can not open after installation?

- A: 1. Confirm whether the software installation plug-in is complete.
2. Verify that the EOS utility software is closed.

Q: Failed to connect Client.

- A: 1. Ensure the stable connection between hardwares.(If the hardware connection is normal, the NIC should light on.)
2. Make sure the target IP is correct (the local IP is 127.X.X.X) by executing ping command.
 3. Make sure the server port is the same as the client.

Try to telnet the target port (Generally, if you can ping the target IP but cannot connect to the target port, it was mainly disable by the firewall or router).

Q: After open the software, the screen appears abnormal phenomenon such as flashing, flower screen.

A: Please adjust the screen to normal status via LEDVISION and then save

it to the receiver card.

Q: Failed to connect the camera.

A: 1. Confirm that the camera model is supported by the software (Software currently only support part of the Canon camera, please contact the technical support for details), please pay attention that the EOS 7D is not the same as the EOS 7D MARK II.

2. Confirm the stable connection between hardwares.
3. Confirm that the camera is open but not dormant.
4. Confirm that the camera is shift to manual mode (M mode).

Q: Failed to shoot the photos.

A: 1. Confirm that the camera model is supported by the software (Software currently only support part of the Canon camera, please contact the technical support for details), please pay attention that the EOS 7D is not the same as the EOS 7D MARK II.

2. Confirm that the camera is shift to manual mode (M mode).
3. Close the lens auto-focus function.

Q: Why the shutter can't be set more than 1/30?

A: 1. Confirm that the camera is shift to manual mode (M mode).

2. Confirm that the multi-function dial is set to shooting mode instead of movie mode.

Q: Fail to analyze photos.

A: 1. Confirm that the camera model is supported by the software (Software currently only support part of the Canon camera, please contact the technical support for details), please pay attention that the EOS 7D is not the same as the EOS 7D MARK II.

2. Try to re-install the software to ensure that components are completed.

3. Please check the shooting quality. Check it like this: click [**open**...] in the [**Photos**] page, then using brightness extract, grey-scale map or histogram function to manual analysis photos whether there is out of focus, overexposure, underexposure, shake, etc.

4. Partition is so large that leads to the dense lamp. (Using the skip point function to reduce lamps density)

5. Too much broken point/dislocation can affect the results of the analysis.

6. The available memory is limited.

Q: The shooting quality is bad after shooting again and again.

A: Out of focus:

1. SLR cameras need to start EVF or use the camera's LIVE mode focus in order to improve the focusing accuracy.

2. Using manual focus to improve accuracy when the auto focus effect is not good enough.

Overexposure/underexposure:

Reset the correct camera parameters on camera adjustment page.

Shake:

1. Make sure shooting system stability.
2. Close the lens and the camera stabilization function.

Q: Screen brightness/saturation reduced after calibration.

A: Brightness calibration makes the screen evenly by reducing the lighter point brightness, thus the screen brightness will decline after calibration.

Chroma calibration makes the screen evenly by reducing the saturation, and it contains the function of the brightness calibration, thus the screen brightness and the saturation will decline after calibration.

Q: Screen appears the noise after calibration.

A: 1. Please check the shooting quality. Check it like this: click [**open**...] in the [**Photos**] page, then using brightness extract, grey-scale map or histogram function to manual analysis photos whether there is out of focus, overexposure, underexposure, shake, etc.

2. Partition is so large that leads to the dense lamps and increase the sampling error.

3. If the gamma table that referred by simulator is not the same as the target, please send parameters to receiver cards.

Q: Screen appears horizontal band after calibration.

A: 1. Shutter speed is too fast, you need to set the shutter slower, and reduce the screen brightness darker to maintain the brightness at the same time.

2. The refresh rate is too low, you need to increase the refresh rate.

Q: Screen appears moire pattern.

A: The phenomenon is caused by the interference system error of the lamp frequency and the pixel frequency.

The system error is divided into two parts, the position error and the brightness error.

Solutions:

1. Confirm the frame was filled with images.
2. Decreasing partition and increasing focus (You need to re-photometry after adjusting the focus).
3. Decreasing focus slightly (You need to re-photometry after adjusting the focus), and then you will shooting in a slightly out of focus condition (But this measure requires the focusing error can not be too large). Enable the skip point function to improve the spacing if you need.
4. Close deseam function for the impact of the position error can be eliminated.



Visual Future

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