

FoV Calculator Tool

User's Manual

V1.0.2

Cybersecurity Recommendations

Mandatory actions to be taken towards cybersecurity

1. Change Passwords and Use Strong Passwords:

The number one reason systems get "hacked" is due to having weak or default passwords. It is recommended to change default passwords immediately and choose a strong password whenever possible. A strong password should be made up of at least 8 characters and a combination of special characters, numbers, and upper and lower case letters.

2. Update Firmware

As is standard procedure in the tech-industry, we recommend keeping NVR, DVR, and IP camera firmware up-to-date to ensure the system is current with the latest security patches and fixes.

"Nice to have" recommendations to improve your network security

1. Change Passwords Regularly

Regularly change the credentials to your devices to help ensure that only authorized users are able to access the system.

2. Change Default HTTP and TCP Ports:

- Change default HTTP and TCP ports for systems. These are the two ports used to communicate and to view video feeds remotely.
- These ports can be changed to any set of numbers between 1025-65535. Avoiding the default ports reduces the risk of outsiders being able to guess which ports you are using.

3. Enable HTTPS/SSL:

Set up an SSL Certificate to enable HTTPS. This will encrypt all communication between your devices and recorder.

4. Enable IP Filter:

Enabling your IP filter will prevent everyone, except those with specified IP addresses, from accessing the system.

5. Change ONVIF Password:

On older IP Camera firmware, the ONVIF password does not change when you change the system's credentials. You will need to either update the camera's firmware to the latest revision or manually change the ONVIF password.

6. Forward Only Ports You Need:

- Only forward the HTTP and TCP ports that you need to use. Do not forward a huge range of numbers to the device. Do not DMZ the device's IP address.
- You do not need to forward any ports for individual cameras if they are all connected to a recorder on site; just the NVR is needed.

7. Disable Auto-Login on SmartPSS:

Those using SmartPSS to view their system and on a computer that is used by multiple people should disable auto-login. This adds a layer of security to prevent users without the appropriate credentials from accessing the system.

8. Use a Different Username and Password for SmartPSS:

In the event that your social media, bank, email, etc. account is compromised, you would not want someone collecting those passwords and trying them out on your video surveillance system. Using a different username and password for your security system will make it more difficult for someone to guess their way into your system.

9. Limit Features of Guest Accounts:

If your system is set up for multiple users, ensure that each user only has rights to features and functions they need to use to perform their job.

10. UPnP:

- UPnP will automatically try to forward ports in your router or modem. Normally this would be a good thing. However, if your system automatically forwards the ports and you leave the credentials defaulted, you may end up with unwanted visitors.
- If you manually forwarded the HTTP and TCP ports in your router/modem, this feature should be turned off regardless. Disabling UPnP is recommended when the function is not used in real applications.

11. SNMP:

Disable SNMP if you are not using it. If you are using SNMP, you should do so only temporarily, for tracing and testing purposes only.

12. Multicast:

Multicast is used to share video streams between two recorders. Currently there are no known issues involving Multicast, but if you are not using this feature, deactivation can enhance your network security.

13. Check the Log:

If you suspect that someone has gained unauthorized access to your system, you can check the system log. The system log will show you which IP addresses were used to login to your system and what was accessed.

14. Physically Lock Down the Device:

Ideally, you want to prevent any unauthorized physical access to your system. The best way to achieve this is to install the recorder in a lockbox, locking server rack, or in a room that is behind a lock and key.

15. Connect IP Cameras to the PoE Ports on the Back of an NVR:

Cameras connected to the PoE ports on the back of an NVR are isolated from the outside world and cannot be accessed directly.

16. Isolate NVR and IP Camera Network

The network your NVR and IP camera resides on should not be the same network as your public computer network. This will prevent any visitors or unwanted guests from getting access to the same network the security system needs in order to function properly.

General

This user's manual (hereinafter referred to be "the Manual") introduces the functions and operations of the FoV Calculator Tool (hereinafter referred to be "the Tool").

Safety Instructions

The following categorized signal words with defined meaning might appear in the Manual.

Signal Words	Meaning
 DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
 CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, lower performance, or unpredictable result.
 TIPS	Provides methods to help you solve a problem or save you time.
 NOTE	Provides additional information as the emphasis and supplement to the text.

Revision History

No.	Version	Revision Content	Release Time
1	V1.0.0	First Release.	January 8, 2018
2	V1.0.1	<ol style="list-style-type: none"> 1. Update the lateral and the top view angle of the general IPC. 2. Update the fisheye model. 	April 16, 2018
3	V1.0.2	<ol style="list-style-type: none"> 1. Add "Cybersecurity Recommendations". 2. Add "Privacy Protection Notice". 3. Update "About the Manual". 4. Add "Pixel Amount" on the main interface of IPC FoV Calculator. 	July 9, 2018

Privacy Protection Notice

As the device user or data controller, you might collect personal data of other such as face, fingerprints, car plate number, Email address, phone number, GPS and so on. You need to be

in compliance with the local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures include but not limited to: providing clear and visible identification to inform data subject the existence of surveillance area and providing related contact.

About the Manual

- The Manual is for reference only. If there is inconsistency between the Manual and the actual product, the actual product shall prevail.
- We are not liable for any loss caused by the operations that do not comply with the Manual.
- The Manual would be updated according to the latest laws and regulations of related regions. For detailed information, see the paper manual, CD-ROM, QR code or our official website. If there is inconsistency between paper manual and the electronic version, the electronic version shall prevail.
- All the designs and software are subject to change without prior written notice. The product updates might cause some differences between the actual product and the Manual. Please contact the customer service for the latest program and supplementary documentation.
- There still might be deviation in technical data, functions and operations description, or errors in print. If there is any doubt or dispute, please refer to our final explanation.
- Upgrade the reader software or try other mainstream reader software if the Manual (in PDF format) cannot be opened.
- All trademarks, registered trademarks and the company names in the Manual are the properties of their respective owners.
- Please visit our website, contact the supplier or customer service if there is any problem occurred when using the device.
- If there is any uncertainty or controversy, please refer to our final explanation.

Table of Contents

Foreword	I
1 Introduction	1
2 Basic Operations	2
2.1 Entrance Interface	2
2.2 IPC FoV Calculator	3
2.2.1 Main Interface	3
2.2.2 Calculating Steps	4
2.2.3 Adjusting Parameters.....	7
2.3 Fisheye FoV Calculator	8
2.3.1 Main Interface	8
2.3.2 Calculating Steps	10
2.3.3 Adjusting Parameters.....	12
2.4 Pixel Density	14

1

Introduction

The FoV Calculator Tool calculates the pixel density of monitored objects for IPC and fisheye cameras under different installation conditions by simulating the actual usage scenarios. The calculation result can provide reference data for product selection and installation.

2 Basic Operations

2.1 Entrance Interface

The entrance interface of the Tool is shown in Figure 2-1.

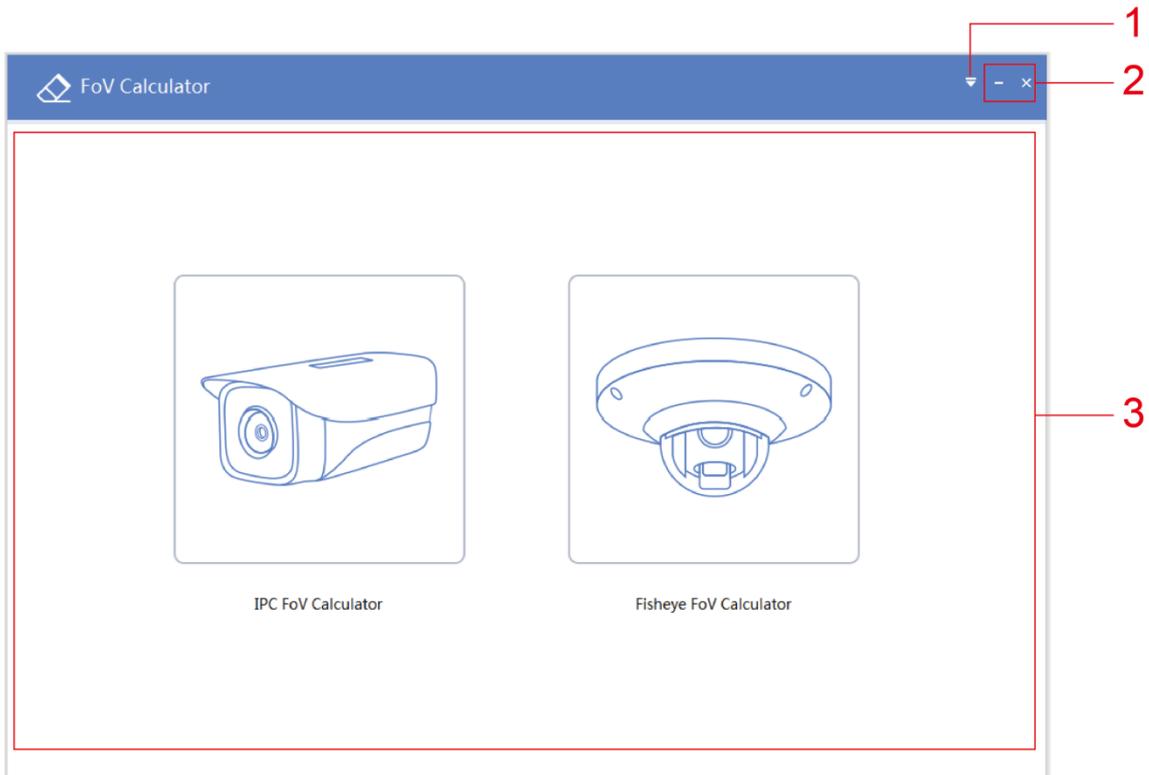


Figure 2-1

For the parameter description of the entrance interface, see Table 2-1.

No.	Parameter	Description
1	Setting	<ul style="list-style-type: none">• Language: Select the language.• Help: View the user's manual of the Tool.• About: View the tool version.
2	Window Control Button	Minimize and close the Tool.
3	Tool Entry Options	Includes two calculators: IPC FoV Calculator and Fisheye FoV Calculator. Click to enter the corresponding FoV Calculator interface.

Table 2-1

2.2 IPC FoV Calculator

NOTE

The views of customized device and the device with variable focal length, and the vertical view of analog device are for reference only.

2.2.1 Main Interface



On the entrance interface, click . The main interface of IPC FoV Calculator is displayed. See Figure 2-2.

NOTE

On the main interface of Fisheye FoV Calculator, click  to switch to the main interface of IPC FoV Calculator.

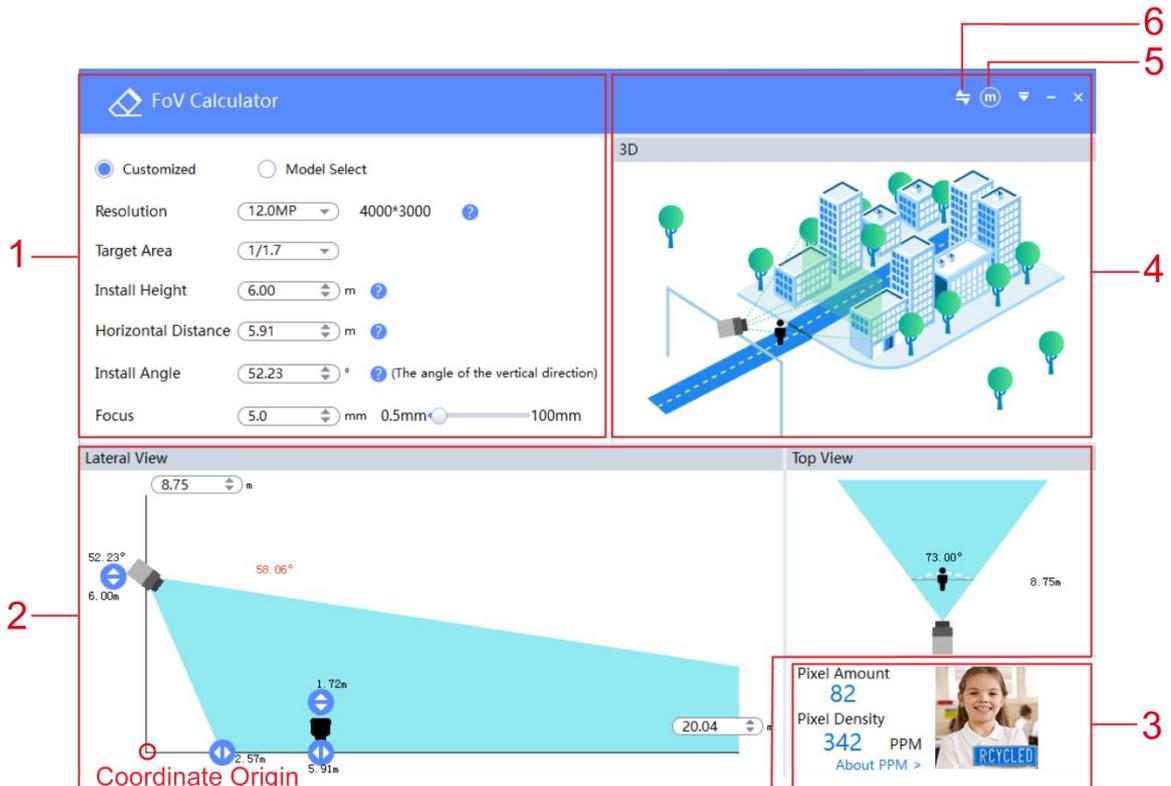


Figure 2-2

For the parameter description of the main interface, see Table 2-2.

No.	Parameter	Description
1	Installation Parameters	<ul style="list-style-type: none"> Select Customized, and then set the parameters such as resolution, target area, install height, and install angel. Select Model Select, the Model Select interface is displayed. Select the target model, the camera resolution and target area parameters are displayed automatically. Then manually enter other parameters.

No.	Parameter	Description
2	Lateral View	<ul style="list-style-type: none"> See the lateral view and top view of the camera under current installation condition. Adjust the camera installation parameters. For details, see "2.2.3 Adjusting Parameters."
	Top View	
3	Pixel Density	Real-time display the pixel amount, pixel density value and sketch map of the camera under current installation condition. Click About PPM to see the image effect of different pixel values. For details, see "2.4 Pixel Density."
4	3D	3D sketch map of the camera usage scenario.
5	Switch Unit	Switch unit between meter and feet.
6	Switch Tool	Switch the main interface between IPC FoV Calculator and Fisheye FoV Calculator.

Table 2-2

2.2.2 Calculating Steps

Step 1 On the main interface, select **Customized** or **Model Select**.

- If you select **Customized**, directly set lens parameters.
- If you select **Model Select**, the **Model Select** interface is displayed, see Figure 2-3. Select the target model and then click **OK**.

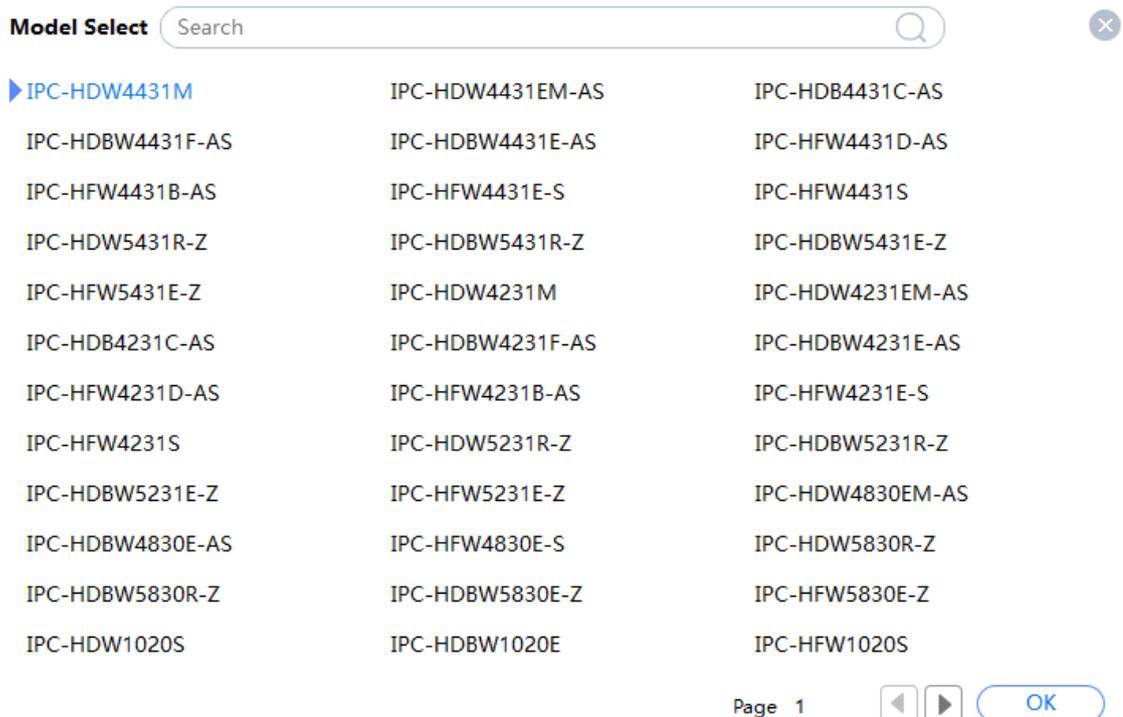


Figure 2-3

Step 2 Configure the settings for lens parameters, see Table 2-3.

Parameter	Description
Resolution	Set the camera resolution, such as 6.0MP.  NOTE If the model has been selected, the camera resolution will be displayed automatically.

Parameter	Description
Target Area	<p>The target area size of the image sensor. According to the resolution, the corresponding target area value which may be one or more options is automatically displayed. If there are multiple options, you can select the required target area value, such as 1/1.8.</p> <p> NOTE</p> <p>If the model has been selected, the camera target area will be displayed automatically.</p>
Install Height	<p>The distance from the camera to the coordinate origin. Select or directly enter the installation height, such as 7. The value cannot be greater than the maximum installation height set in Lateral View area.</p> <p> NOTE</p> <p>If the value is not in the normal range, it can be automatically adjusted.</p>
Horizontal Distance	<p>The horizontal distance from the monitored object to the coordinate origin. Set the horizontal distance of the snapshot, such as 10. The value cannot be greater than the maximum horizontal distance set in Lateral View area.</p>
Install Angle	<p>The angle between the camera lens and the Y axis. The value cannot be 0. Select or directly enter the installation angle value, such as 65.30.</p>
Focus	<p>There are two situations for the settings for focus.</p> <ul style="list-style-type: none"> ● If you select Customized, select or directly enter the lens focus value, such as 8. The value range is 0.5mm-100mm. You can also select the focus length by dragging the adjusting lever (). ● If you select Model Select, use one of the following methods depending on the selected model. <ul style="list-style-type: none"> ◇ Select the lens focus value in the Focus list. ◇ Set the lens focus by selecting or directly entering the lens focus value.

Table 2-3

When the setting is completed, the setting results are displayed immediately in the **Lateral View** area and the **Top View** area, and you can see the real-time image effect in the **Pixel Density** area. See Figure 2-4.

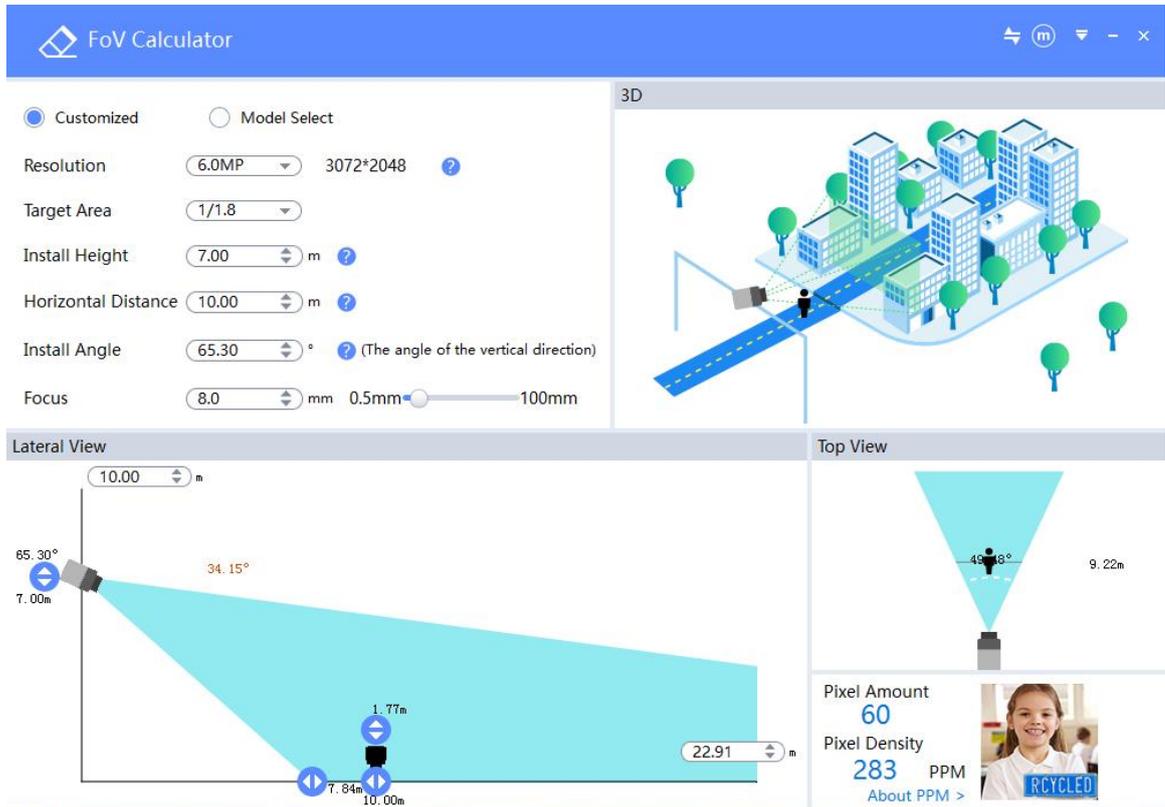


Figure 2-4

Click , the position of each parameter is displayed in the 3D area. See Figure 2-5.

- : Resolution
- : Installation height
- : Horizontal distance
- : Installation angle

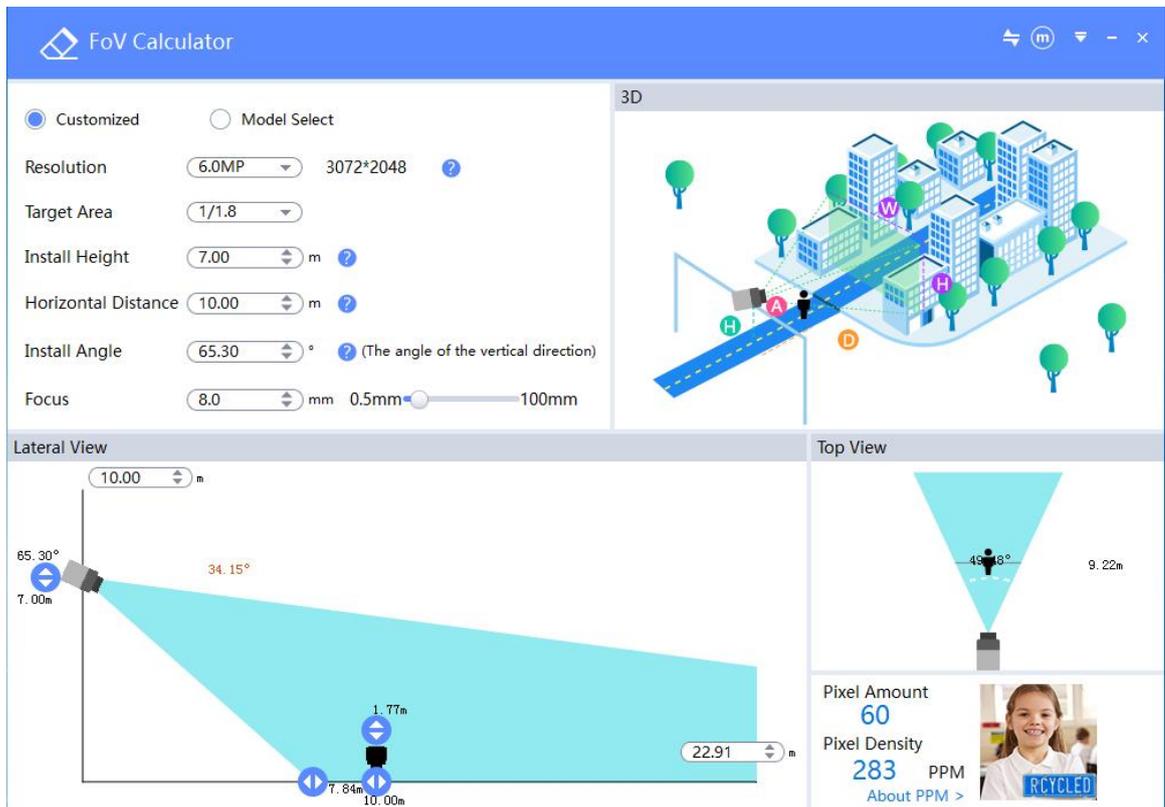


Figure 2-5

2.2.3 Adjusting Parameters

After the calculation is completed, you can adjust the camera installation parameters in the **Lateral View** area if the results do not meet the requirements. See Figure 2-6. After adjustment, the real-time image effect is displayed in the **Pixel Density** area.

🔑 TIPS

You can click **About PPM** to see the definition of pixel density and understand the image effect that can be achieved by different pixel density, which can provide reference for parameter adjustment. For details, see "2.4 Pixel Density."

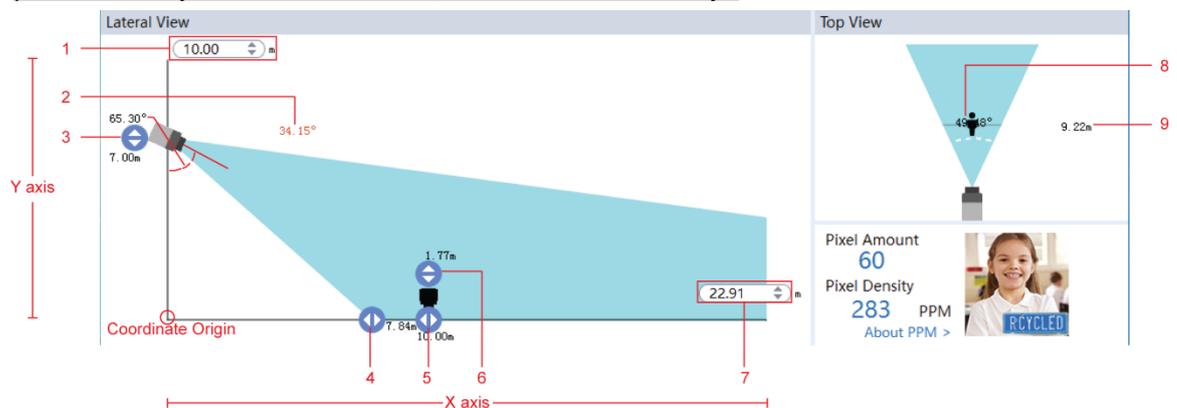


Figure 2-6

For the parameter description of the **Lateral View** area and the **Top View** area, see Table 2-4.

No.	Parameter	Description
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No.	Parameter	Description
1	Maximum installation height	Select or enter the maximum installation height.  NOTE If the value is not in the normal range, it can be automatically adjusted.
2	Lens vertical view	Display the lens vertical view, which varies according to the camera resolution, target area, and focus.
3	Installation height and angle adjustment button	Drag the button upwards or downwards to adjust the installation height and angle (such as 65.30° shown in Figure 2-6).
4	View display adjustment button	Drag the button leftwards or rightwards to adjust the display effect of the object in the angle of view. The maximum value is the maximum horizontal distance of the object.
5	Horizontal distance adjustment button	The horizontal distance from the object to the coordinate origin. Drag the button leftwards or rightwards to adjust the horizontal distance.
6	Object height adjustment button.	Drag the button upwards or downwards to adjust the object height. The pixel density varies according to the object height.  NOTE The maximum object height is half of the Y axis.
7	Maximum object horizontal distance	Select or enter the maximum horizontal distance between the object and the coordinate origin.  NOTE If the value is not in the normal range, it can be automatically adjusted.
8	Lens horizontal view	Display the lens horizontal view, which varies according to the resolution, target area, and focus.
9	Width of lens horizontal view	The width of lens horizontal view that the object is located.

Table 2-4

2.3 Fisheye FoV Calculator

2.3.1 Main Interface



On the tool entrance interface, click  , the main interface of Fisheye FoV Calculator is displayed. See Figure 2-7 and Figure 2-8.

On the main interface of IPC FoV Calculator, click  to switch to the main interface of Fisheye FoV Calculator.

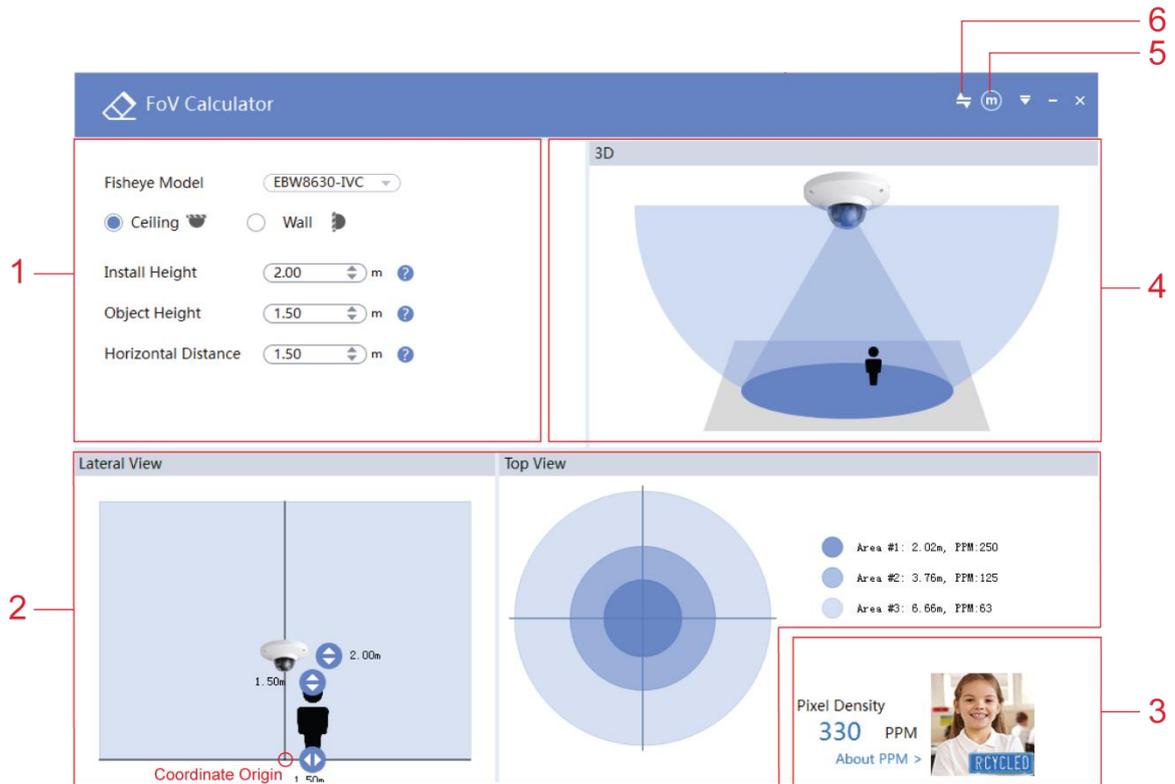


Figure 2-7

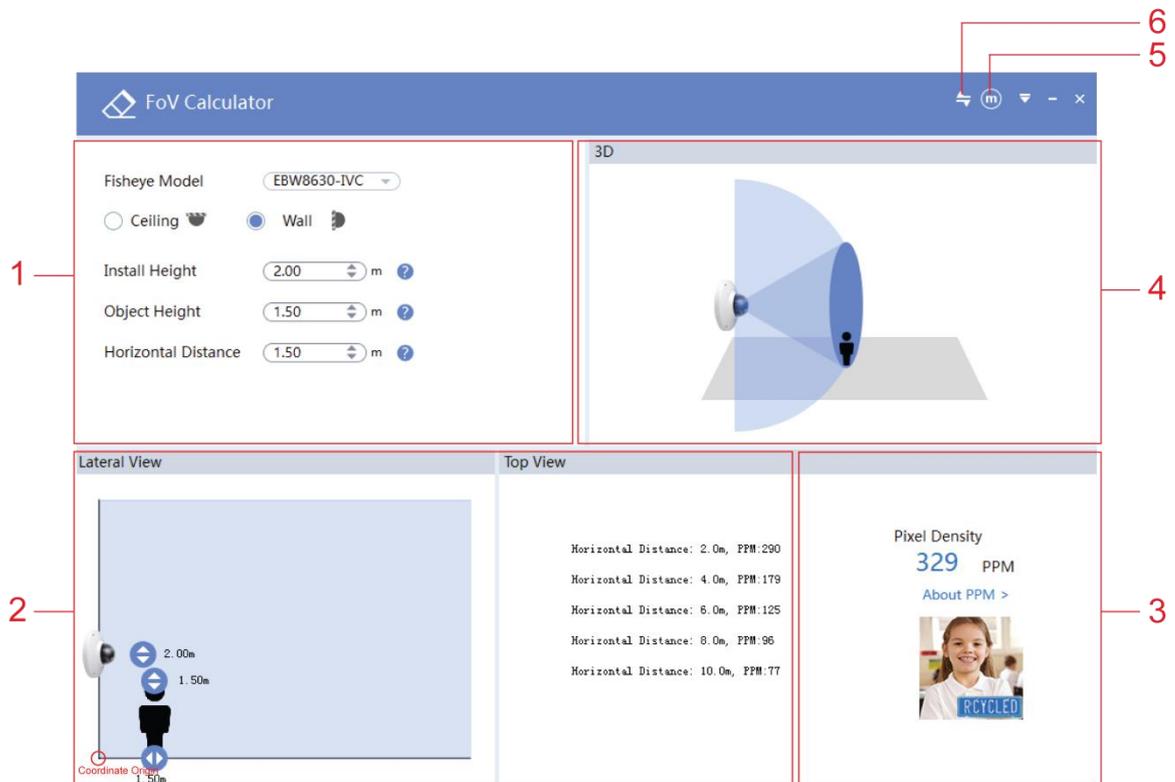


Figure 2-8

For the parameter description of the main interface, see Table 2-5.

No.	Parameter	Description
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No.	Parameter	Description
1	Installation Parameters	Set the installation parameters such as fisheye model, installation method and install height.
2	Lateral View	See the lateral view and top view of the camera under current installation condition.
	Top View	Adjust the camera installation parameters. For details, see "2.3.3 Adjusting Parameters."
3	Pixel Density	Real-time display the pixel density value and sketch map of the camera under current installation condition. Click About PPM to see the image effect of different pixel values. For details, see "2.4 Pixel Density."
4	3D	3D sketch map of the camera usage scenario.
5	Switch Unit	Switch unit between meter and feet.
6	Switch Tool	Switch the main interface between IPC FoV Calculator and Fisheye FoV Calculator.

Table 2-5

2.3.2 Calculating Steps

Step 1 On the main interface, select fisheye model such as **EBW8630**.

Step 2 Select the installation method such as **Ceiling**.

Step 3 Select or enter the values of **Install Height**, **Object Height**, and **Horizontal Distance** respectively. For example set the **Install Height** to **3.68**, set the **Object Height** to **1.8**, and set the **Horizontal Distance** to **5**.

When the setting is completed, the setting results are displayed immediately in the **Lateral View** area and the **Top View** area, and you can see the real time image effect in the **Pixel Density** area. See Figure 2-9.

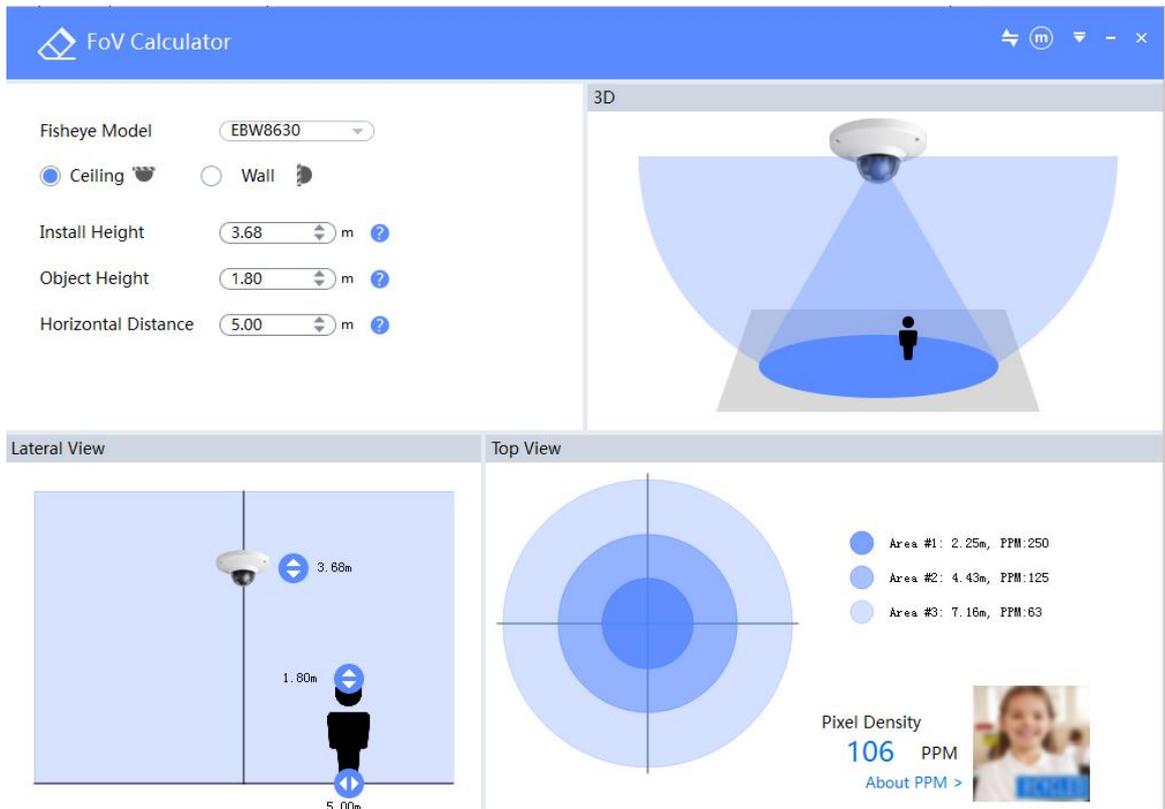


Figure 2-9

Click , the position of each parameter is displayed in the 3D area. See Figure 2-10.

- : Object height
- : Install height
- : Object horizontal distance

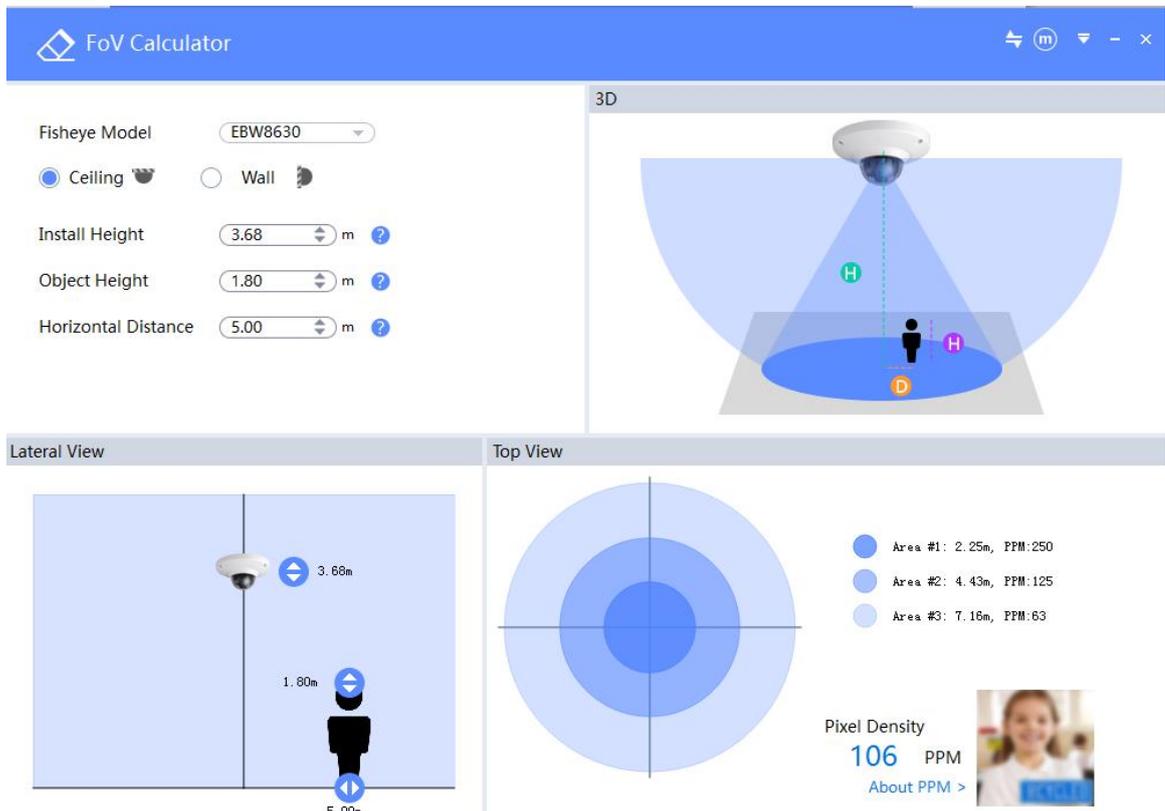


Figure 2-10

2.3.3 Adjusting Parameters

After the calculation is completed, you can adjust the camera installation parameters in the **Lateral View** area if the results do not meet the requirements. See Figure 2-11 and Figure 2-12.

After adjustment, the real-time pixel density and image effect are displayed in the **Pixel Density** area.

TIPS

You can click **About PPM** to see the definition of pixel density and understand the image effect that can be achieved by different pixel density, which can provide reference for parameter adjustment. For details, see "2.4 Pixel Density."

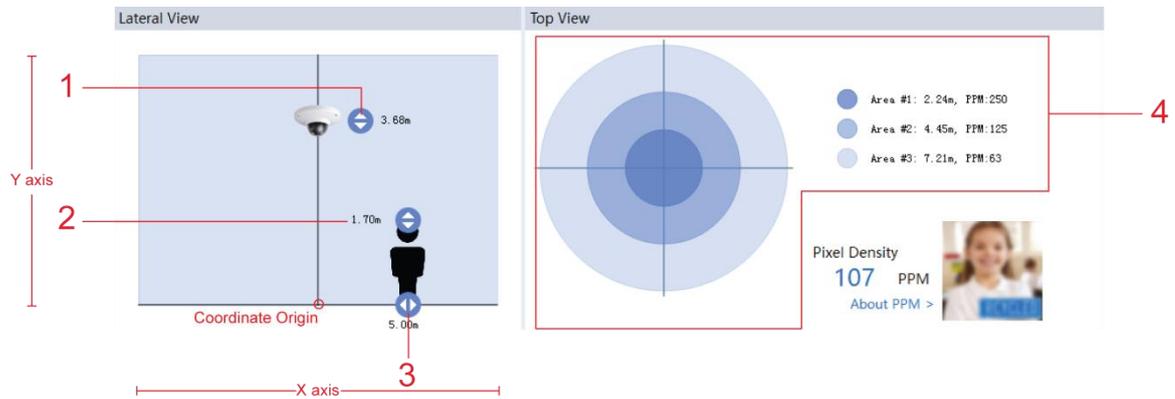


Figure 2-11

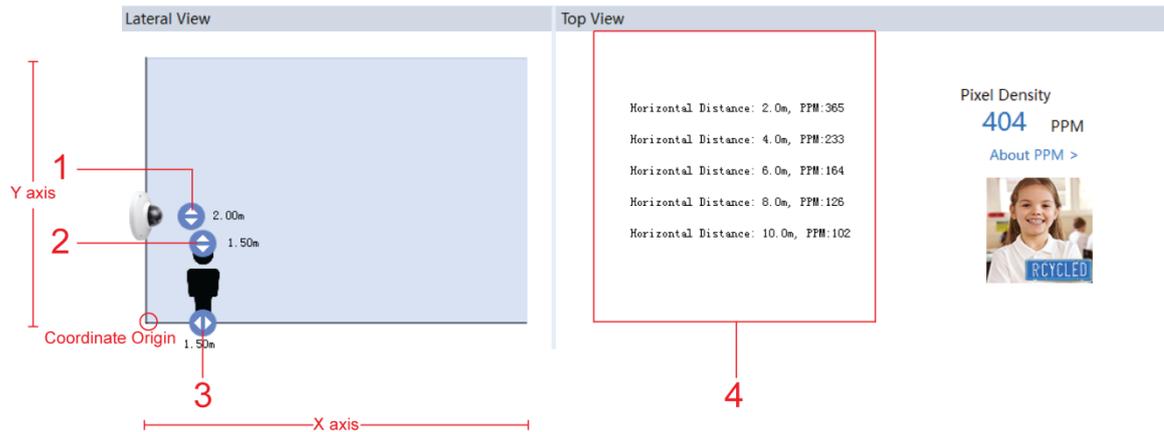


Figure 2-12

For the parameter description of the **Lateral View** area and the **Top View** area, see Figure 2-6.

No.	Parameter	Description
1	Installation height	Drag the button upwards or downwards to adjust the installation height. The maximum installation height is 5m.
2	Object height	Drag the button upwards or downwards to adjust the object height. The maximum object height is 5m.
3	Horizontal distance	The horizontal distance refers to distance between the monitored object and coordinate origin. The maximum horizontal distance is 5m. Drag the button leftwards or rightwards to adjust the horizontal distance.
4	Ceiling mounting trend chart	The radius distance of each region to the coordinate origin and the corresponding pixel density values. The lighter the color, the smaller the pixel density.
	Wall mounting trend table	The radius distance of each region to the coordinate origin and the corresponding pixel density values. The lighter the color, the smaller the pixel density.

Table 2-6

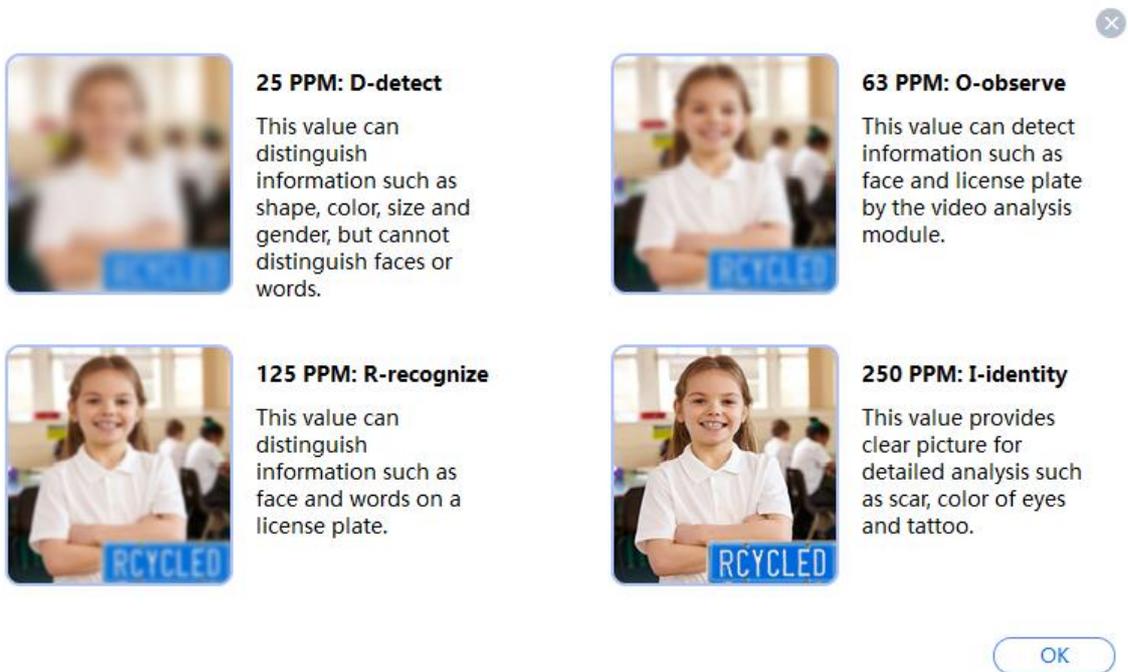
2.4 Pixel Density

The image display in pixel density area can help you understand the image effect under current installation conditions. You can also see the pixel density definition to understand image recognition range of different pixel density.

 NOTE

For the PPM value displayed in the main interface, "NA" indicates that the object is not in the camera view range. "0" indicates that the object is in the camera view range, but the calculation is close to 0 or 0.

- Real-time display: In the lower right corner of the main interface, the image effect of the pixel density area varies in real-time according to the parameters setting.
- View pixel density definition: Click **About PPM**, the pixel density interface is displayed. See Figure 2-13.



The screenshot shows a window titled 'About PPM' with a close button (X) in the top right corner. It displays four examples of a girl holding a 'RECYCLED' sign, illustrating different levels of image clarity and their corresponding PPM values:

- 25 PPM: D-detect**: This value can distinguish information such as shape, color, size and gender, but cannot distinguish faces or words.
- 63 PPM: O-observe**: This value can detect information such as face and license plate by the video analysis module.
- 125 PPM: R-recognize**: This value can distinguish information such as face and words on a license plate.
- 250 PPM: I-identity**: This value provides clear picture for detailed analysis such as scar, color of eyes and tattoo.

An 'OK' button is located at the bottom right of the window.

Figure 2-13

Click **OK** or  to close the pixel density interface.