

IPC Smart Functions Operation Guide

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1 Smart Plan

1.1 Function Description

Smart plan is the master switch for intelligent analysis such as “Face Detection”, “Heat Map”, “IVS”, “People Counting” and so on, the corresponding intelligent functions can be valid after smart plan is enabled.

Step 1

Select “Setup > Event > Smart Plan”. The system will display the interface of “Smart Plan”, which is shown in Table 1-1.



Table 1-1 Smart Plan

Step 2

Click “Save” to complete the configuration of smart plan.

2 People Counting

2.1 Function Description

People counting function is to make statistics and analysis about the enter and exit situation of the people flow in the designated area, it can search the people flow enter and exit report in the cycle of year, month and day on the client end.

2.2 Test Location Requirements

2.2.1 Flow Direction Requirements

The scene needs to face the flow direction directly (the direction of flow movement has to be relatively uniform without being tangled, see Table 2-1).



Table 2-1 Standard People Counting Scene

2.2.2 Scene Requirements

- 1) Make sure there is no obstacle in the view, try to select the background with simple texture such as floor or wall;
- 2) Try to avoid the complicated scene with light frequent change, backlight and direct light;
- 3) Unsuitable application scenes:

SN	Description	Note	Pictures
1	Flow interacted	Flow is complicated and interacted, result is seriously affected.	

<p>2</p>	<p>Flow direction is not straight</p>	<p>Wrong flow direction, fail to follow the algorithm rule</p>	
<p>3</p>	<p>Blocked</p>	<p>The scene is badly blocked, fail to make statistics.</p>	
<p>4</p>	<p>Not high enough, the head is too big or incomplete</p>	<p>The camera is installed too low, which leads to the situation that the target pixel covers bigger proportion in the image.</p>	
<p>5</p>	<p>Horizontal distance too far, the head becomes too small.</p>	<p>Target is too small, which causes leak detection.</p>	

6	Statistics coverage exceeds statistics width	The scene is too wide, head becomes small, leak detection.	
7	Big light change	Light brightness and darkness change is too big, recognition is affected, and people counting is greatly affected.	

Table 2-2 Unsuitable People Counting Scene

Note: It will cause great influence on the result of people counting if it fails to install the camera by conforming to requirements strictly or the image quality fails to meet the requirement.

2.2.3 Height Requirements

- 1) Vari-focal (H > 2.8 meters): vari-focal device is recommended to make people counting statistics
- 2) Fixed focal (only for reference):

Resolution	f(mm)	H(m)
2MP	2.8	2.8
2MP	3.6	3

2.2.4 Coverage Width Requirements

It is recommended that the width of exit and entrance should be within 3 meters, it is advised to install several cameras to make people counting statistics for the entrance whose width is more than 3 meters.

2.2.5 Ceiling Installation Requirements

The device is installed right above the entrance and exit, it forms 90° vertically between lens angle and horizontal. It needs to adjust focal length for vari-focal device:

Resolution	Shoulder width
1280*960	Approx. 280px
1920*1080	Approx.420px

2048*1536	Approx. 448px
2560*1440	Approx. 560px

2.3 Configuration

2.3.1 Web Configuration

Log in web → Setup → Event → People Counting (refer to Table 2-3)

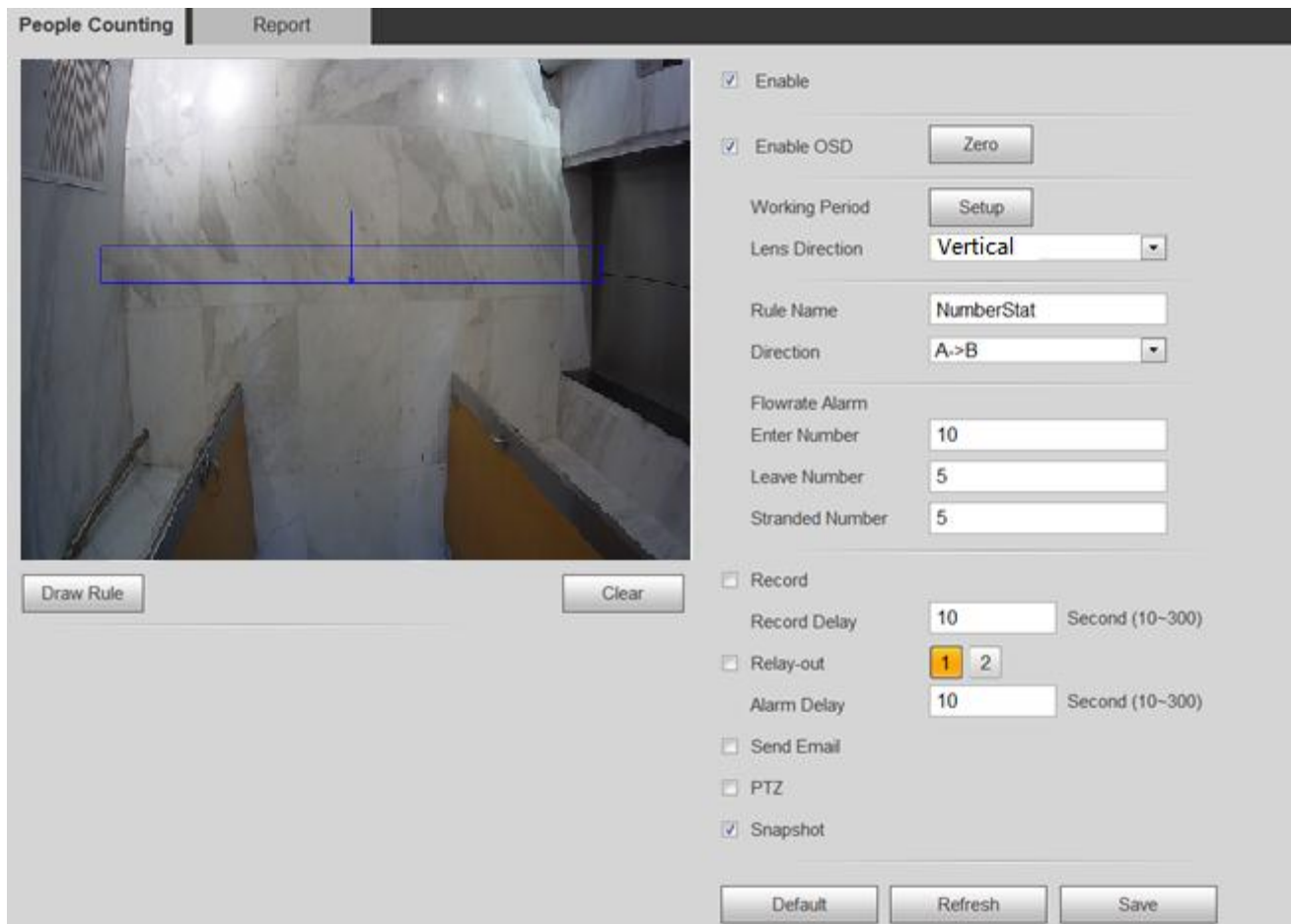


Table 2-3 People Counting Configuration

2.3.2 Rule Setup

Generally the rule box is drawn in the middle of the flow near the entrance and exit, the width of rule box has to be wider than the entrance and exit, the height of rule box has to be bigger than the default min height of the system, which is to avoid performance (refer to Table 2-4).



Table 2-4 People Counting Rule Setup

2.3.3 Report

Report type: Bar chart and line chart.

Export save format: .bmp, .csv

People Counting | **Report**

Report Type

Start Time End Time

Flow Direction Enters Exits Display Number Bar Chart Line Chart

Table 2-5 People Counting Report

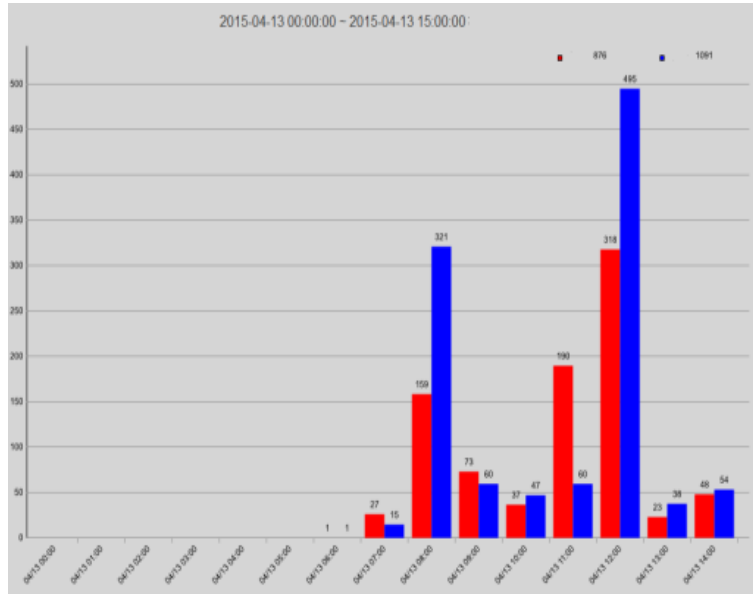


Table 2-6 Bar Chart Report

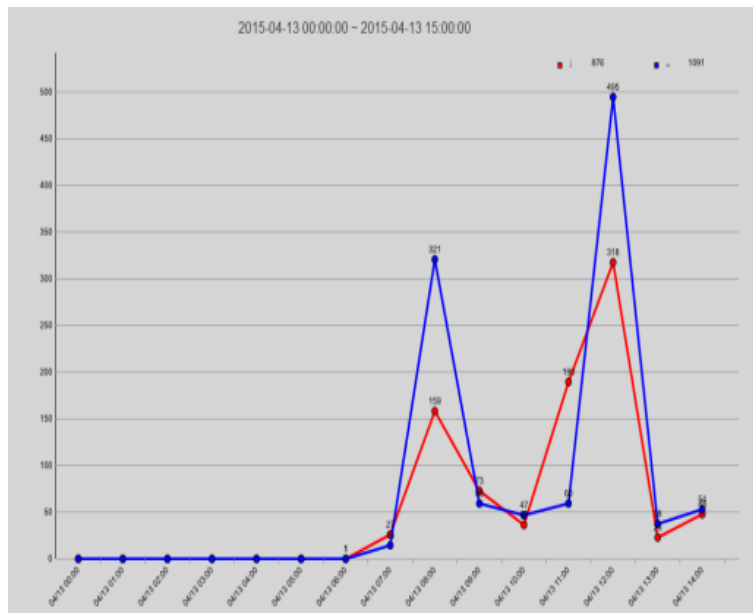


Table 2-7 Line Chart Report

2.4 Attentions

- 1) Make respective statistics about the enter and leave number in the designated area in the image.
- 2) Reduce the pixel of shoulder if the statistics is more than the actual number, conversely, it has to add pixel.
- 3) Reset on the setup interface: the enter and leave data of OSD overlay will be cleared, the data in the report won't be deleted. The reset strategy of people counting is: reset after 0'clock, manual reset, modify system time and reset the next day.
- 4) The max data capacity in report is 1 year (Note: HDBW4231F-MPC can only store for 1.5 months), it will realize auto recycle to cover by hours after the capacity is full.
- 5) The statistics data will be lost when the hardware is restored to default.

3 Stereo Vision People Counting Function

3.1 Function Description

Based on deep learning algorithm, it is to realize more precise data statistics analysis over people counting in the designated area. The client can check the report of people counting report which is made according to the cycle of year, month and day.

3.2 Test Location Requirements

3.2.1 Model Selection and Installation Requirements

Applicable Model: HDW8341X-3D



Table 3-1 HDW8341X-3D

Installation Requirements: 2.2 meters H <math>< 5</math> meters

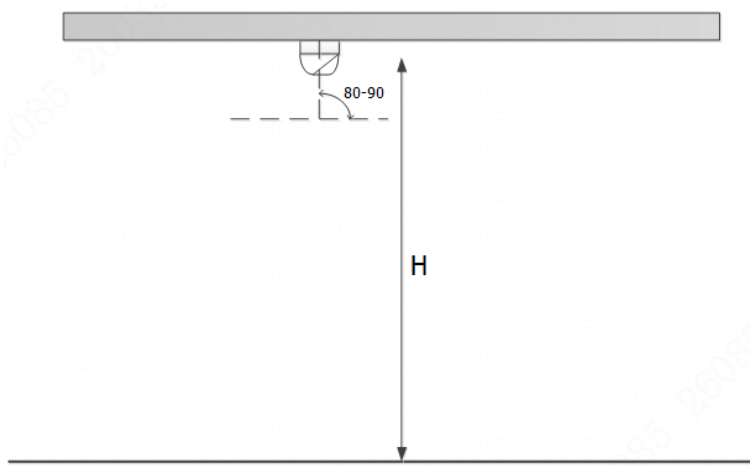


Table 3-2 Installation Guide

3.2.2 Scenario Requirements

The device lens forms 90° with the horizontal surface (the lens is installed downward vertically), the light is sufficient and stable within the detection image, the direction of people flow is from up to down without interlace, make sure the image is not blocked and the people shoulder has to be totally within the image –

the effect of this installation mode is the best.

Example of standard installation scene:

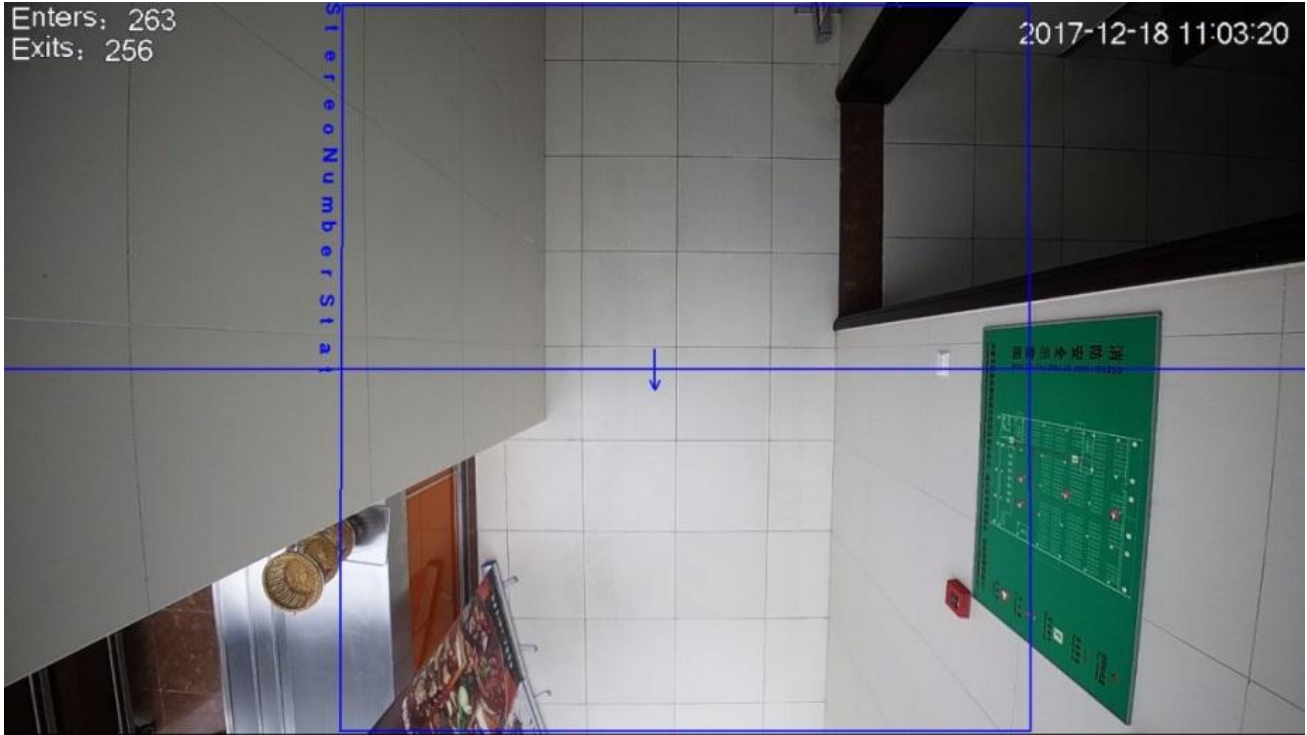


Table 3-3 Standard People Counting Scene

Wrong example of installation scene:

SN	Description	Note	Pictures
1	Flow interacted	Flow is complicated and interacted, result is seriously affected.	

2	Big light change	Light brightness and darkness change is too big, recognition is affected, and people counting is greatly affected.	
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Table 3-4 Unsuitable People Counting Scene

3.2.3 Height and Coverage Width Requirements

Model: HDW8341X-3D

Focal Length (mm)	Height Range (m)	Installation Height (m)	Max Monitoring Range (m)
2.8	2.2-3.5	2.2	1.10
		3.5	4.30
3.6	3.5-5.0	3.5	2.60
		5.0	5.10

Device quantity selection and installation specification

- 1) Only needs to install one device within max monitoring range according to the above table.

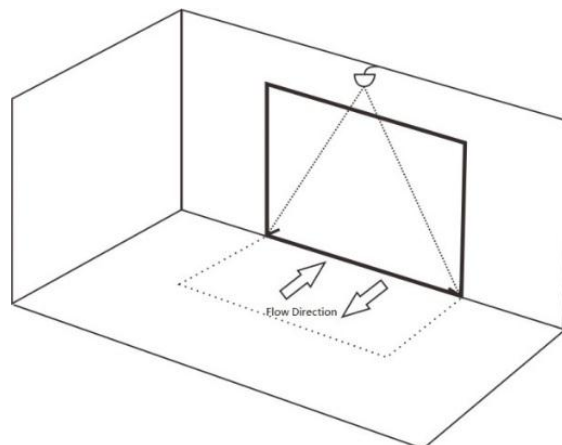


Table 3-5 One Device Installation

- 2) It needs to install several devices if over the camera's max monitoring range.

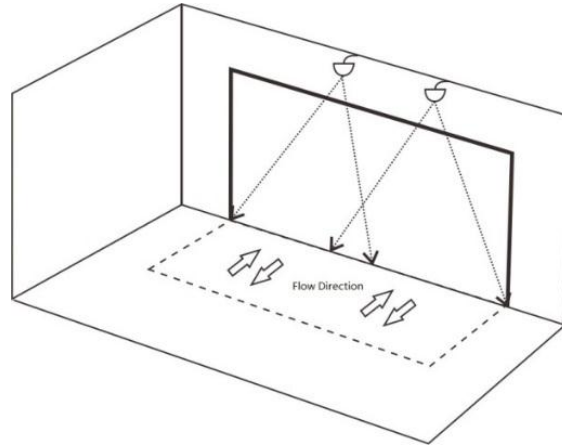


Table 3-6 Several Devices Installation

3.3 Configuration

3.3.1 Web Configuration

Step 1

Enable the smart plan of people counting, and then make relevant settings in people counting. The operations are shown as follows:

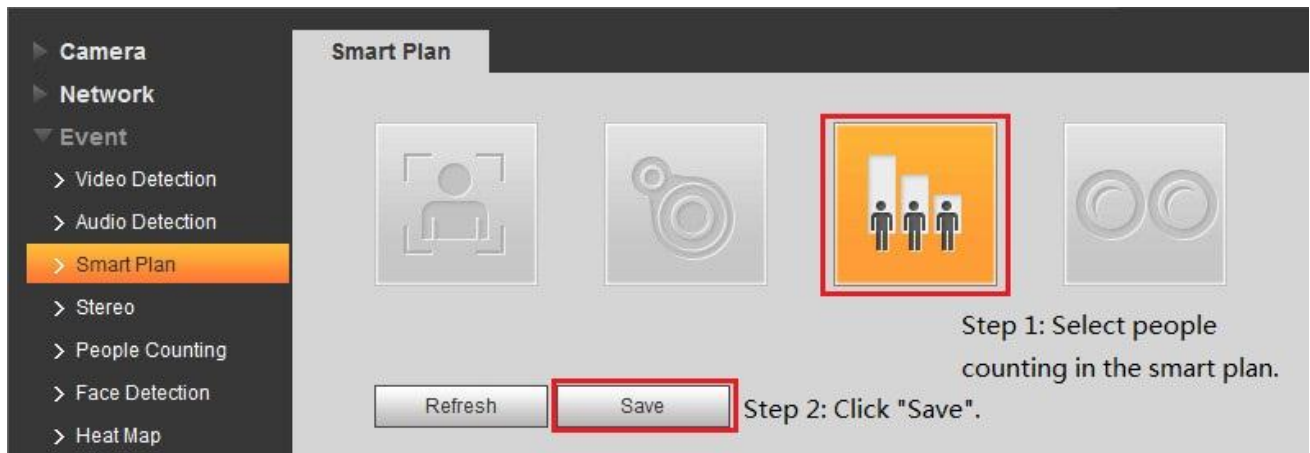


Table 3-7 Enable People Counting in Smart Plan

Step 2

Configure corresponding parameters after the rule is enabled:

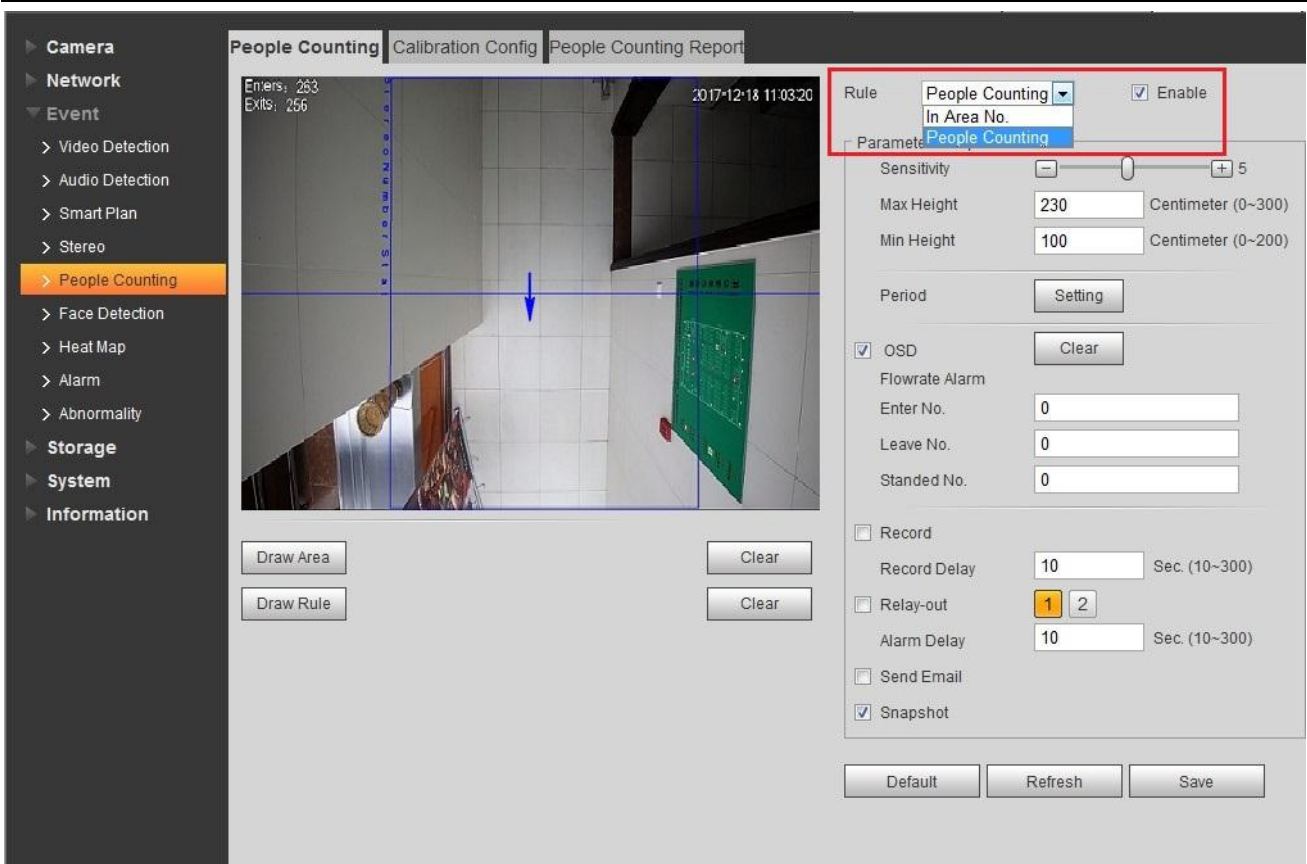


Table 3-8 People Counting Configuration

The description of key configuration parameters is shown as follows:

Sensitivity: It is to detect the sensitivity degree of the object, the bigger the value is, the more sensitive it becomes, the higher the detection rate is, meanwhile false alarm rate increases as well;

Max detection height: it will not be detected if it exceeds the object height;

Min detection height: it will not be detected if it is lower than the object height.

3.3.2 Calibration Configuration

Enter “People Counting” interface, select “Calibration Config” and then operate the setting according to the steps shown in Table 3-9:

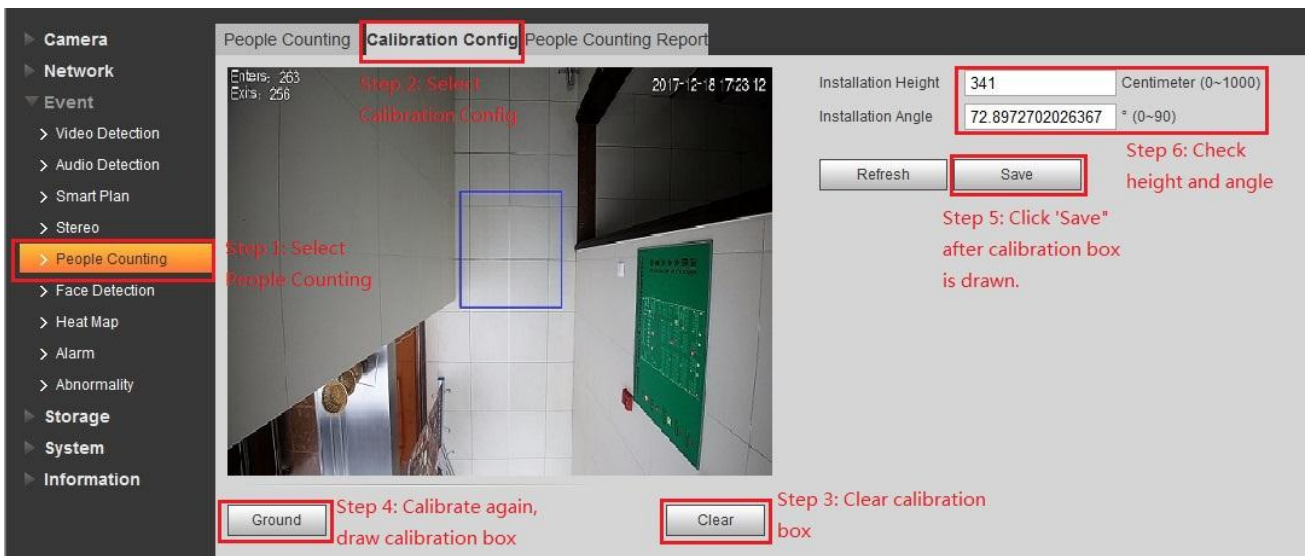


Table 3-9 Calibration Configuration

Step 1: First click “Clear”;

Step 2: Click “Ground”;

Step 3: Click “Save”;

Step 4: The area will auto display the camera height and angle.

Note: It is okay as long as the height and angle displayed by camera conform to the actual numerical value;

3.3.3 Rule Box Configuration

Draw Visitor Flow and Area People Counting Rule:

- 1) It only needs to draw a closed area for the rules of visitor flow and area people counting; the difference is that it only needs to draw an extra direction for visitor flow, which is used to distinguish the direction of enter and leave.
- 2) The rule line should be drawn from left to right, the direction faces downward when drawing direction for visitor flow;
- 3) The rule line should be drawn from right to left, the direction faces upward when drawing direction for visitor flow;
- 4) The rule line is drawn in the center of the image;
- 5) As for the scene where only one device is installed: the length has to exceed the road width when drawing rule line.
- 6) As for the scene where several devices are installed: the overlapped area between cameras cannot be avoided when drawing rule line, it can try to avoid the overlapped area via drawing the length of line for adjacent cameras according to the actual statistics;

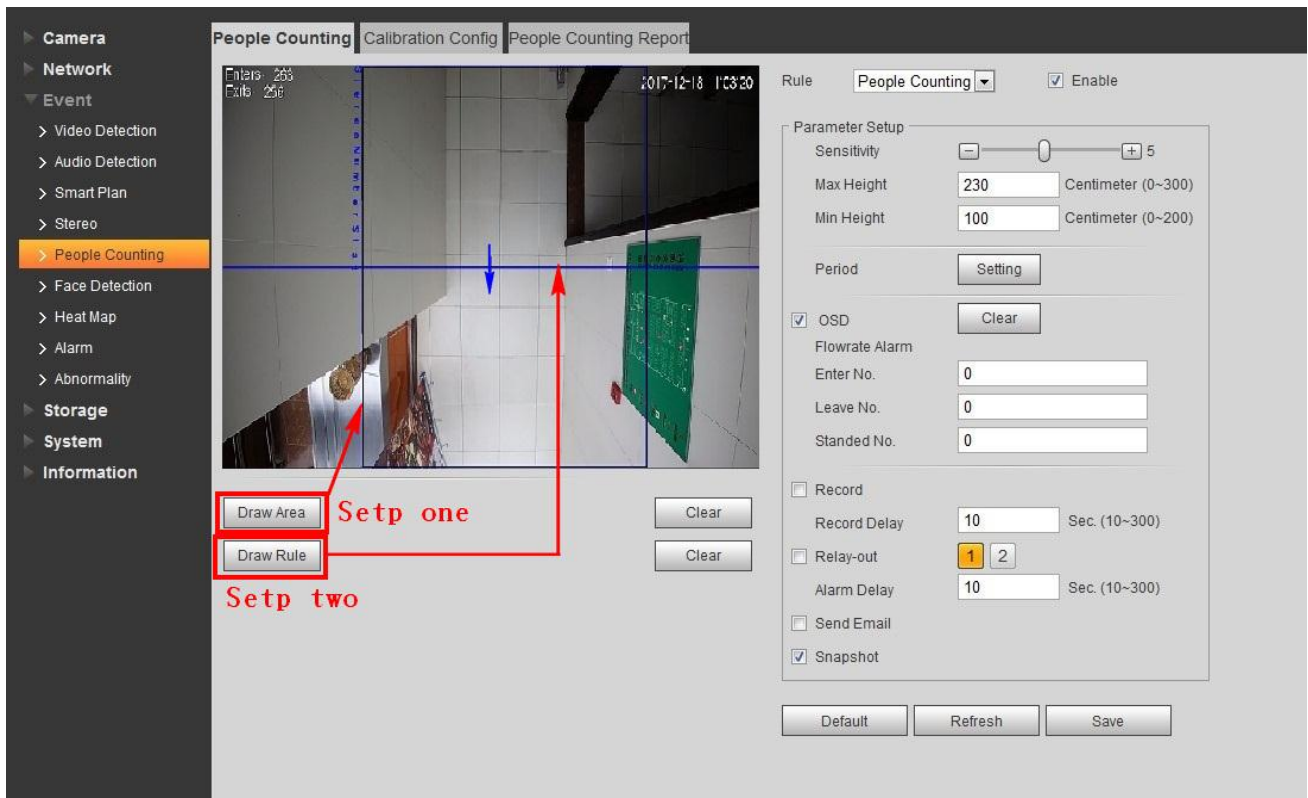


Table 3-10 Rule Box Configuration

3.4 Attentions

3.4.1 Factors which Affect Statistics Rate

- 1) The installation height of visitor flow is no less than 2.2m, the optimal mounting angle is 90° vertically downward;
- 2) The people flow direction has to be vertical with the line direction of the camera;
- 3) The monitoring area shall be below the camera;
- 4) False alarm exists in the intelligent algorithm, sensitivity and false alarm form direct proportion, the higher the sensitivity is, the corresponding false alarm increases;
- 5) The calibration height and angle may not conform to the actual height and angle, you can make several calibrations to exclude accidental disturbance, try to draw a big box during calibration; please contact after-sale service if the abnormal data keeps showing up;
- 6) There is offset for tracking box and object;
- 7) The detection rate of intelligent algorithm will be greatly lowered in the B/W mode, try not to use intelligent algorithm.
- 8) The objects (width is similar to shoulder breadth) such as luggage box will be included as statistics.
- 9) For wide entrance or exit, several devices are deployed, the overlapped area cannot be avoided, it may cause false statistics due to length of rule line of the adjacent devices;
- 10) The line is located in the middle of the picture, make sure the track of enter and leave is complete, it doesn't appear or disappear suddenly;
- 11) It may cause wrong people counting when loitering on the line;

- 12) It may cause false statistics due to big change of light;
- 13) It may cause false statistics if two people walk shoulder to shoulder;
- 14) The movement direction of visitor flow is not vertical with the rule line;

3.4.2 People Flow Data Classification

People flow data classification: Software data, Hardware data.

Software data: It is the enter and leave date which are displayed on the OSD.

Hardware date: It is the data report after people counting of several days, which has been written into the hardware FLASH and will not be lost in general situation.

Software data reset (exclude hardware data):

- The following operations will not remove the hardware data of the accumulated people flow statistics:
- OSD displays page reset, which means the overlapped data of enter and leave for OSD will be cleared, generally it is cleared manually.
- Restore factory default configuration, generally it is operated manually.
- It will auto clear after midnight, which means it will clear and start statistics of the next day after 23:59:59 every night.
- Modify device time to the second day, and then it is cleared via OSD.

Hardware data reset:

- Please operate carefully; the following operations may lose the statistics data of accumulated flow report of previous several days.
- Telnet remove configuration, it will clear hardware data, which means it will lose the report data of accumulated people flow of the previous several days.
- Hardware recover, dismantle the dome cover and press the RESET button on the device chip, and it will lose the report data of accumulated people flow of previous several days.

Data statistics cycle:

The max data statistics cycle of the report is 1 year; it will cover the data automatically by hours after 1 year. Data statistics cycle is max. 1 year: from the day when it is enabled to the day of next year.

Reboot with power off:

It will not cause OSD data loss when the power is off, nor will it cause hardware data loss.

4 Face Detection

4.1 Function Description

It is to detect if there is any human face in the video image and send the small picture of the detected human face to the back end for analysis. It can link to snapshot, record and alarm.

4.2 Test Location Requirements

4.2.1 Installation Requirements

The camera should be installed in front of the center of entrance and exit, it is installed with inclined mode,

which is shown in Table 4-1.

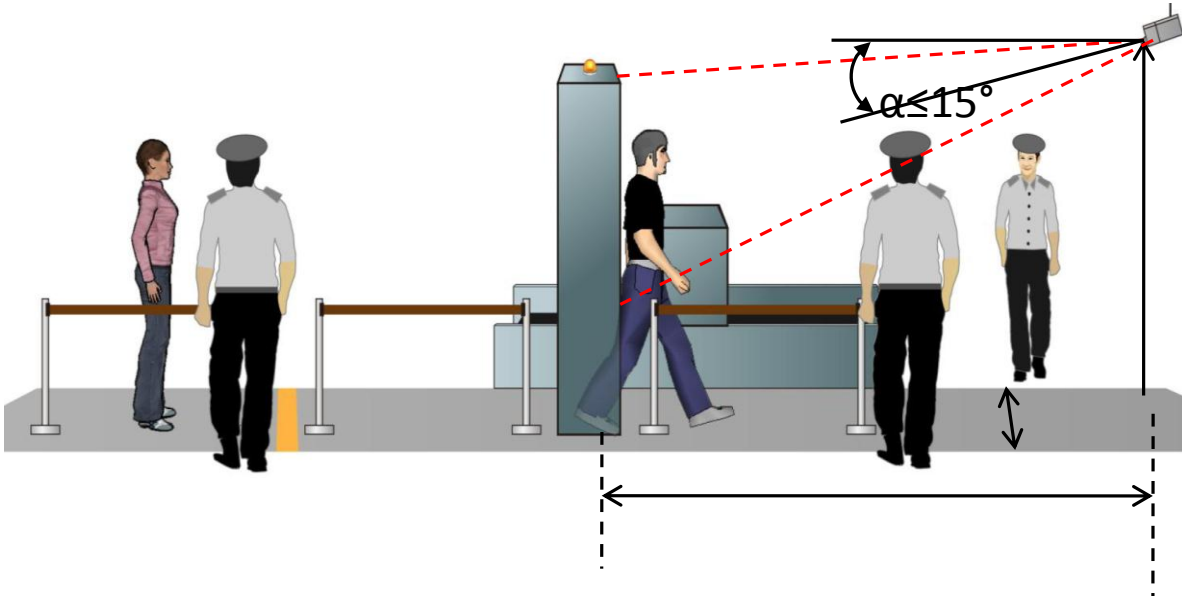


Table 4-1 Camera Installation

The horizontal distance between camera and monitoring target is $d(m)$, the camera installation height is $h(m)$, depression angle of camera is $\alpha(\text{degree})$ (it is the included angle between the camera monitoring direction and horizontal surface). You can refer to the following parameter table:

Parameter	Recommended value	Range
Height $h(m)$	2.5	2~3
Horizontal distance $d(m)$	6	4~20
$\alpha(\text{degree})$	≤ 15	10~15

If the actual situation fails to meet the settings recommended in the table above, you can refer to the table below. Select the most suitable parameter configuration if it can guarantee that the face pixel is more than 150 x 150 (it can reach 200 x 200 ideally) in 1080P.

Height(m)	Horizontal distance(m)
2	4~20
2.25	5~20
2.5	6~20
2.75	7~20
3	8~20

4.2.2 Debugging Requirements

- 1) Select test point (it is recommended to select the test point where there is good light, try to avoid backlight and sidelight), lay a camera in the location which is d meters horizontally away from the test point, the fixed height is h meters. (please select d and h according to the table above)
- 2) Installation person A stands in the test point, look ahead horizontally, installation person B will adjust the IPC; Adjust the camera angle, monitoring range, focal length until it meets the following requirements:
 - a) The human face is in the center of the image, and it is clear.
 - b) Make sure the width of the face is more than 150 x 150 pixel in 1080P resolution (take snapshot

via IPC web, use paint tool to check image pixel, the distance between the center of both eyes is required to be more than 50 pixels.)

- 3) Make sure the requirements above should be satisfied, and then fix the camera and lens. The installation person A passes the monitoring point from far to near, installation person B checks the monitoring image to make sure it can acquire front, clear face whose width and height is bigger than 150 pixels when person A is passing monitoring point, then it means the installation is successful. The ideal monitoring effect is shown in Table 4-2.

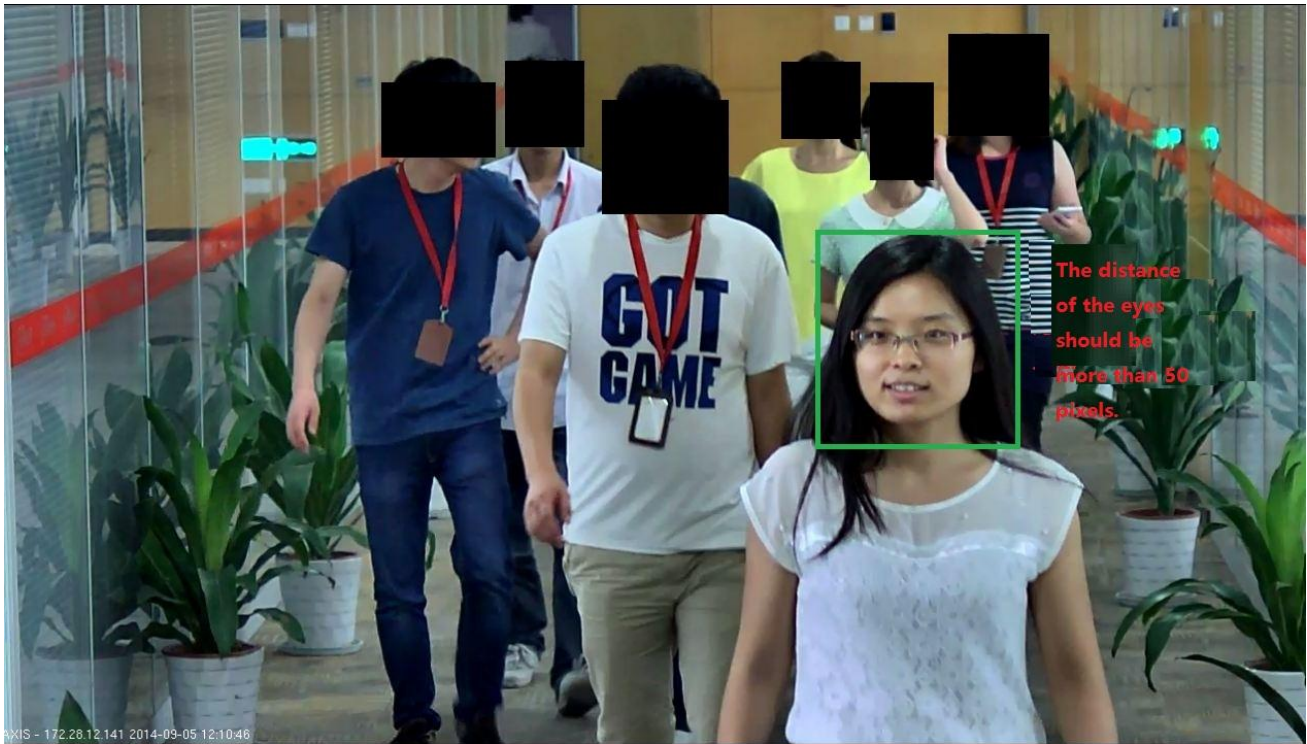


Table 4-2 Standard Face Detection Scene

4.3 Configuration

Log in web → Setup → Event → Face Detection , see the figure below.

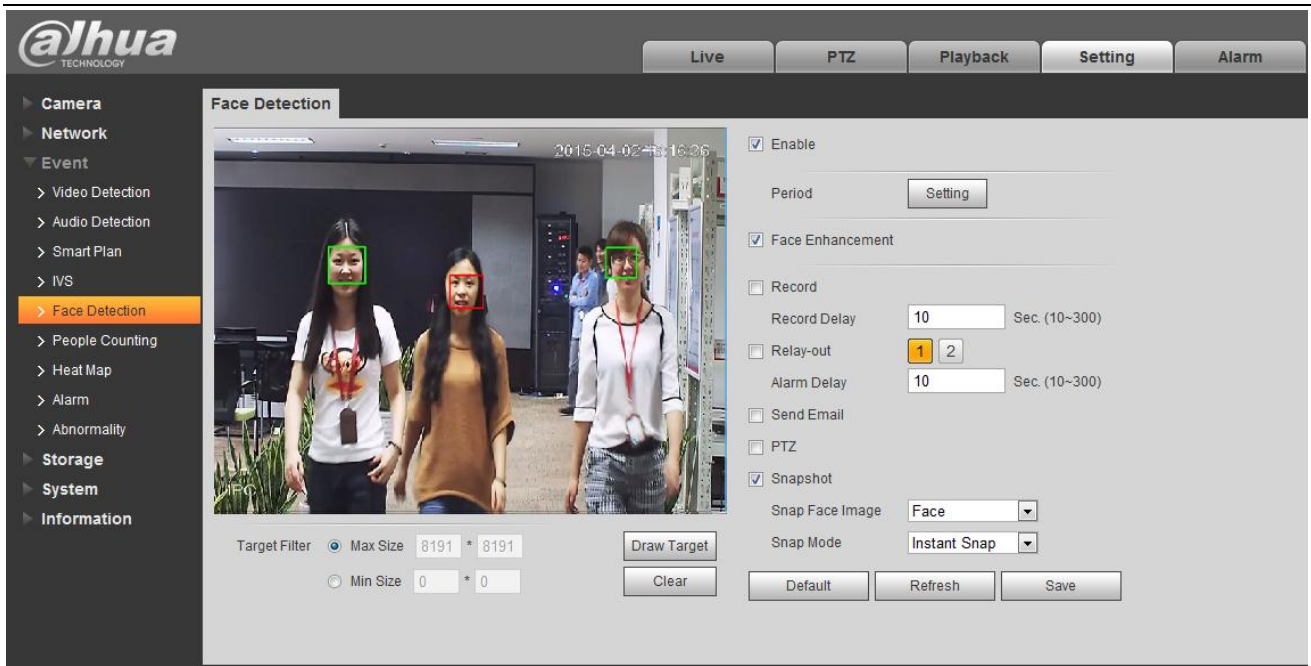


Table 4-3 Face Detection Configuration

4.4 Optimized Snap

It supports snap the best quality face picture when you select optimized snap. See the figure below.

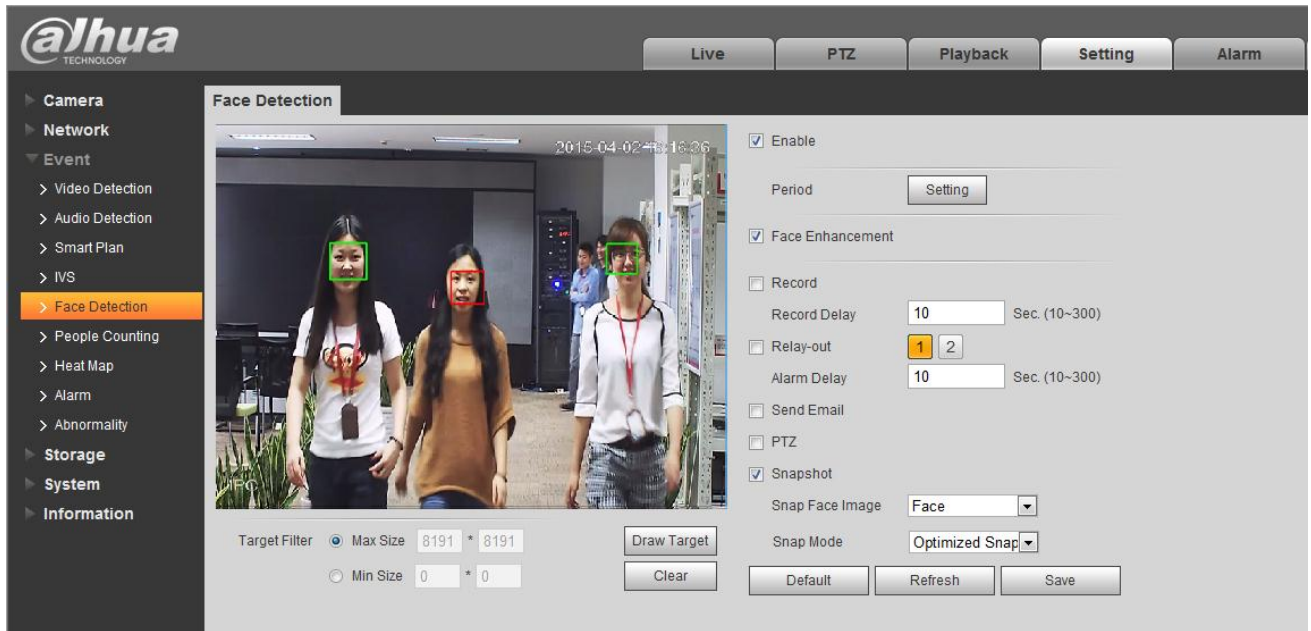


Table 4-4 Optimized Snap

5 Deep Learning Face Function

5.1 Function Description

Based on deep learning of algorithm, it is to take snapshot and make recognition upon the faces which appear in the image, it can activate snapshot, record and alarm.

Applicable model: HF8242F-FD and HF8242F-FR

5.2 Test Location Requirements

It is advised to confirm snapshot location and monitoring image direction in order to reduce face backlight, and then confirm installation location.

Example of standard installation scene:

- 1) The selected spot shall have uniform luminance, try to avoid advertising board on one side and cause trouble to the faces;
- 2) Try to select the spot from south to north in outdoor environment, reduce strong backlight and front lighting caused by sunlight;
- 3) The recommended spots where face recognition cameras can be installed such as metro gate; middle of the long passage with good luminance, upward escalator, and security door without backlight.



Table 5-1 Applicable Face Detection Scene

Wrong example of installation scene:

SN	Description	Note	Pictures
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<p>1</p>	<p>Backlight</p>	<p>Backlight and ununiformed light has great influence on algorithm accuracy</p>	
<p>2</p>	<p>Flow direction is not straight</p>	<p>It is not recommended to select the scene with complicated people flow which may cause side face and affect recognition.</p>	
<p>3</p>	<p>Scene width is too big</p>	<p>Monitoring width is not allowed to exceed 3 meters, it is recommended to deploy several devices if it exceeds 3 meters.</p>	
<p>4</p>	<p>Dark scene</p>	<p>Recognition is affected in dark environments, light compensation is recommended.</p>	

5.3 Installation Requirements

Install a face recognition camera 7-10m away from the snapshot location, mounting height shall be between 2.5m and 3m; the device shall face the middle of the passage;

Select suitable lens according to the snapshot location:

Snapshot location (m)	Height (m)	Lens (mm)	Model	Depression Angle (Degree)
5	2	10.5~42	DH-PLZ21C0-D	13°±3°
7	2.5	10.5~42	DH-PLZ21C0-D	13°±3°
8	2.8	10.5~42	DH-PLZ21C0-D	13°±3°
9	3	10.5~42	DH-PLZ21C0-D	13°±3°
12	3.5	15~75	DH-PFL1575-A12D	13°±3°

Note: The width of snapshot location shall not exceed 3m, the snapshot location width of matched IVS-7500 shall not exceed 3m (face pixel is required to be 120).

5.4 Debugging Requirements

5.4.1 Debugging Preparation

Attentions:

- 1) Make sure the program of test device is the latest version before debugging, GDP can select “Program Type” according to models, baseline, general revised. It is okay to acquire the program of latest date.
- 2) Device debugging needs to set different parameters according to different scenes, for some scenes, it needs two sets of configuration to realize effect display, it can adopt schedule switch configuration, which is shown as follows:

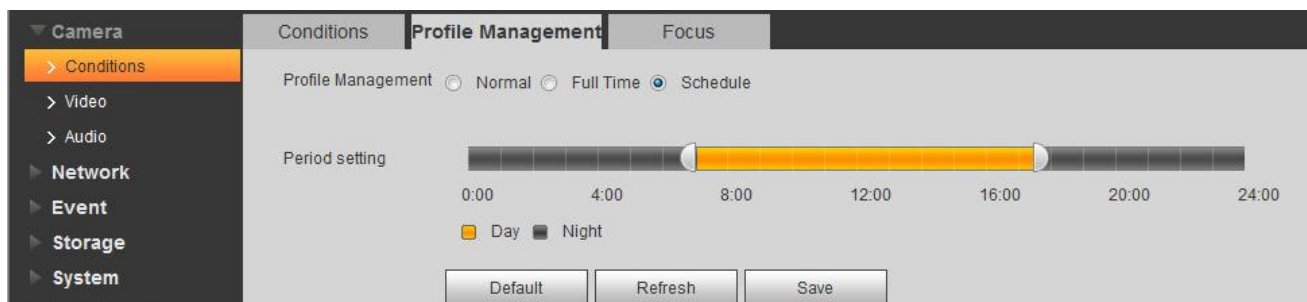


Table 5-2 Profile Management

Enable Face Recognition mode:

Face recognition mode is set as follows (face recognition is enabled and it will auto activate parameter switch of bottom layer image upon the image parameter of face debugging), all other modifications are debugged on this basis.

Step 1

Enable “Face Recognition” in smart plan

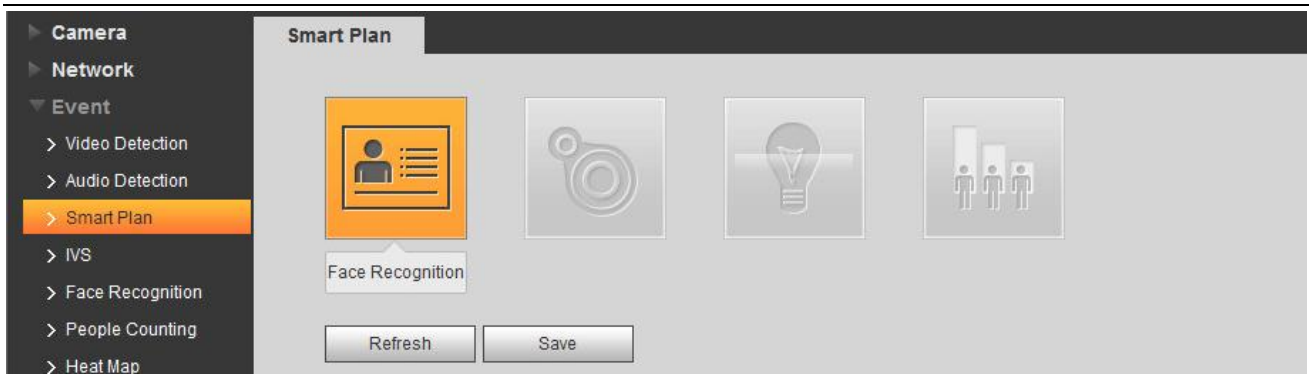


Table 5-3 Enable Face Detection in Smart Plan

Step 2

Enter the interface of “Face Recognition” and enable the function.

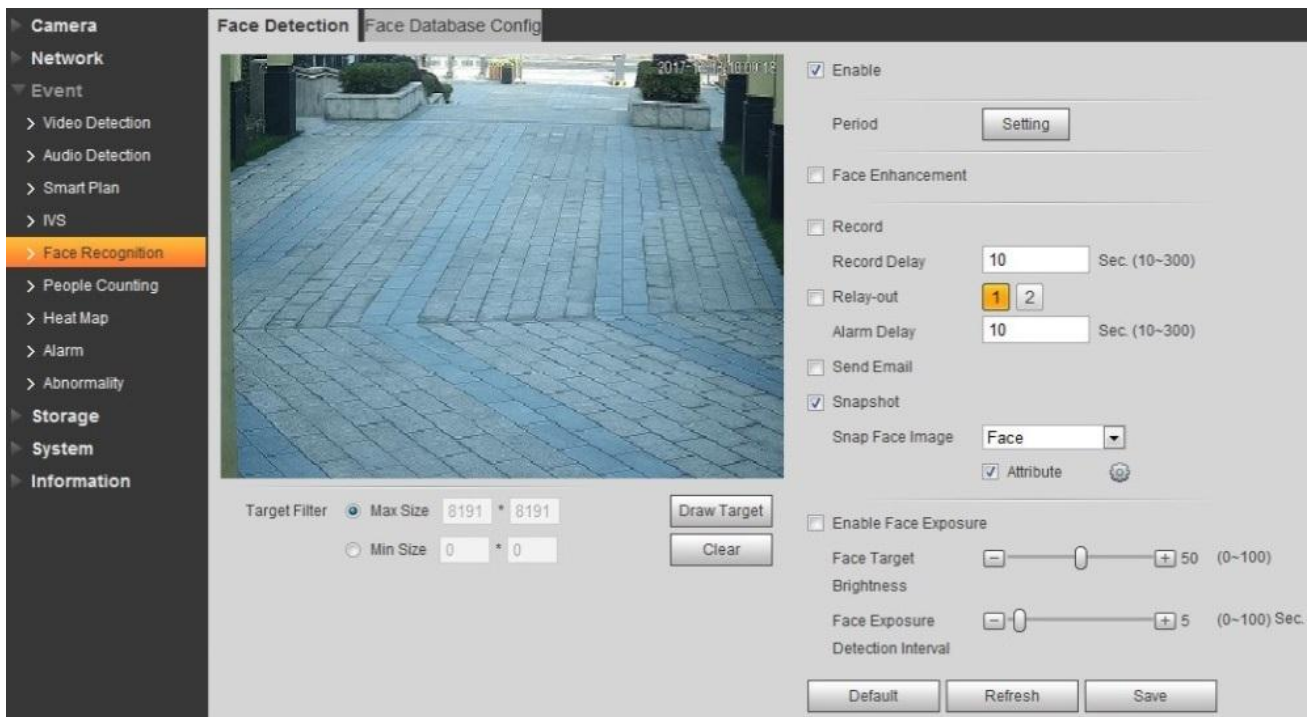


Table 5-4 Face Detection Configuration

5.4.2 General Scene

- 1) Debug “Exposure” parameter.

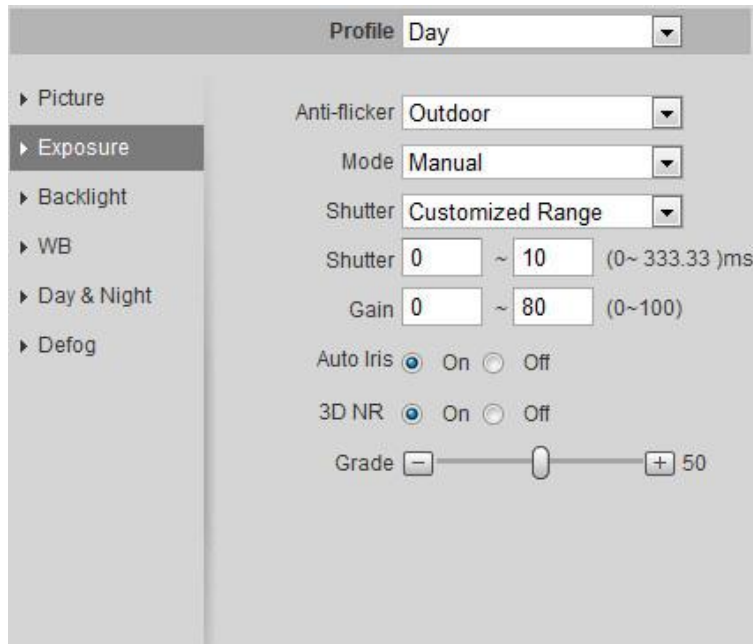


Table 5-5 “Exposure” Parameter Debugging Reference

2) It can adjust “Image” parameter if necessary.

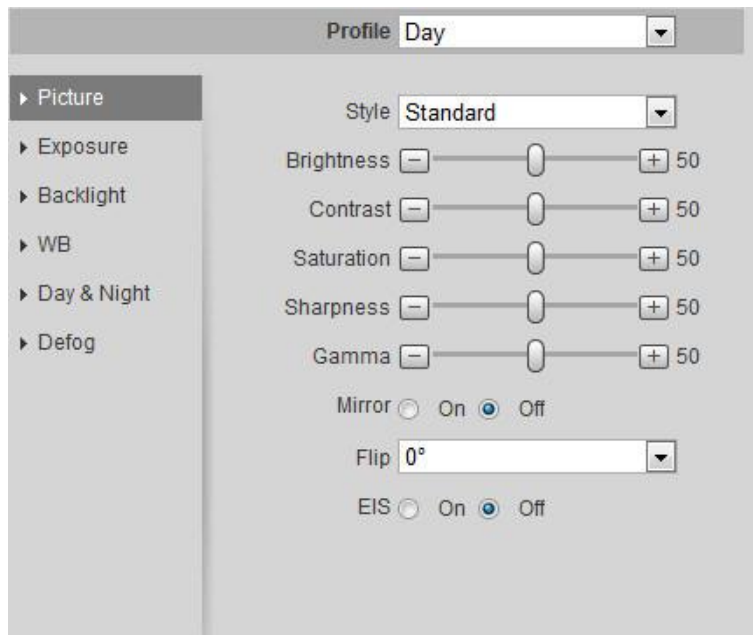


Table 5-6 “Image” Parameter Debugging Reference

3) Face noise and details debugging.

5.4.3 WDR Scene

There are three methods of WDR scene debugging:

1) Enable digital WDR

Digital WDR: parameter range 1-44. It can enhance the face with high brightness, but it will be overexposed outdoors with big noise.

2) Enable true WDR

True WDR: parameter range 45-100. It is to guarantee outdoor high brightness area details, but the face brightness will be a little darker than DWDR, and double image may happen to the edge of moving human body.

3) Enhance shutter and gain exposure lower limit

It can better enhance face brightness, but it is completely overexposed, it only focuses on face and it may cause face brightness change according to light condition if there is intense sunlight change.

On-site debugging can be compared according to local actual situation, select the better situation. There are still some harsh scenes which cannot be avoided after general scenes have been adjusted, for example, the dynamic range of the scene is quite wide, this scene generally is passage or entrance, the people are in the shadow of the building, the face is very dark if it is to observe with naked eyes, so it is recommended to use true WDR. It is okay to observe face brightness with naked eyes if the dynamic range of the scene is medium; it can identify the five sense organs on the face. So it is recommended to use digital WDR first when the people walk in the tree shadow on the road; certainly you can select one method after you see the result of both DWDR and TWDR.

Method 1 Debugging Based on DWDR

- 1) The mode is modified as WDR in the backlight scene, debug within the parameter range of 1-44, the brighter the face is, the bigger the noise becomes.

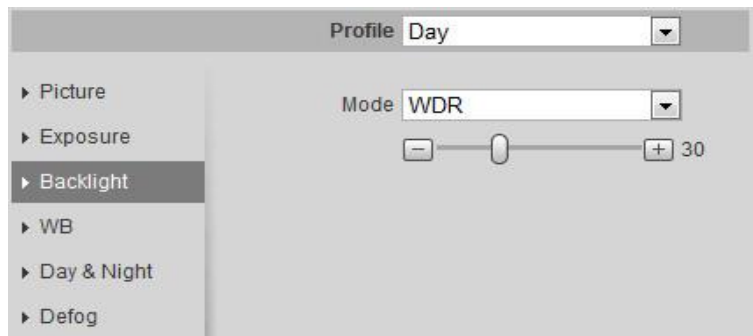


Table 5-7 “DWDR” Parameter Debugging Reference

- 2) Adjust “Exposure Parameter” as shown in Table 5-5.
- 3) It can try to debug Gamma if the face brightness is not enough as shown in Table 5-6.
- 4) Face noise and detail debugging as shown in Table 5-5.
- 5) Face Color Debugging as shown in Table 5-6.
- 6) Total color debugging: total color cast can switch WB mode, generally “Outdoor” or “Street Lamp” mode can be solved.

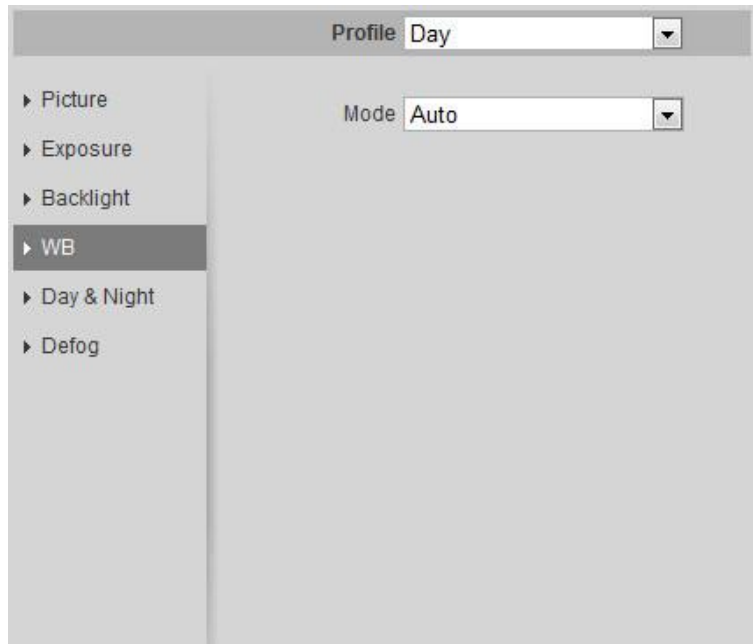


Table 5-8 “White Balance” Parameter Debugging Reference

Method 2 Debugging Method Based on True WDR

- 1) The mode is changed as WDR in the backlight scene, debug within the parameter range of 45-100, the bigger the number is, the brighter the face is, the brighter the total image becomes, but with bigger noise.

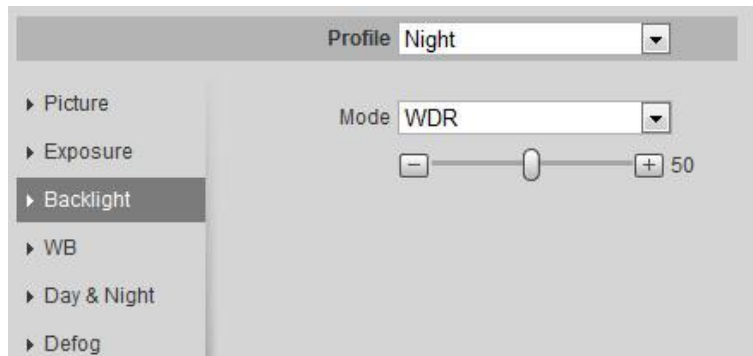


Table 5-9 “WDR” Parameter Debugging Reference

- 2) Adjust “Exposure” parameter as shown in Table 5-5.
- 3) It can try to debug Gamma parameter if the face is dark as shown in Table 5-6.
- 4) Debuggin of Face Noise and Details as shown in Table 5-5.
- 5) Face Color Debugging as shown in Table 5-6.
- 6) Debugging of Total Color as shown in Table 5-8.

Method 3 Debugging Method Based on Enhancing Shutter Lower Limit and Gain

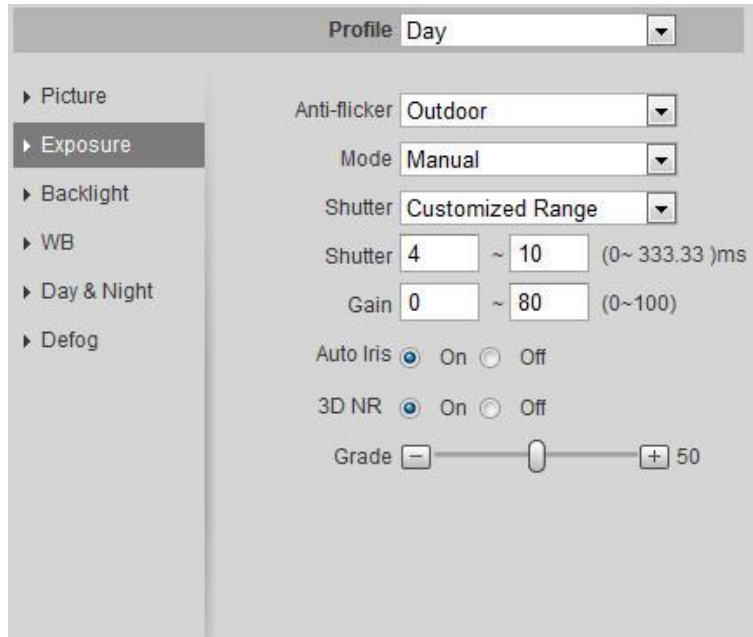


Table 5-10 “Gain & Shutter” Parameter Debugging Reference

5.5 Configuration Operation

5.5.1 HF8242F-FR Face Recognition Function Configuration

- 1) Enable “Face Recognition” smart plan on web, and then enable the function of “Face Recognition”.

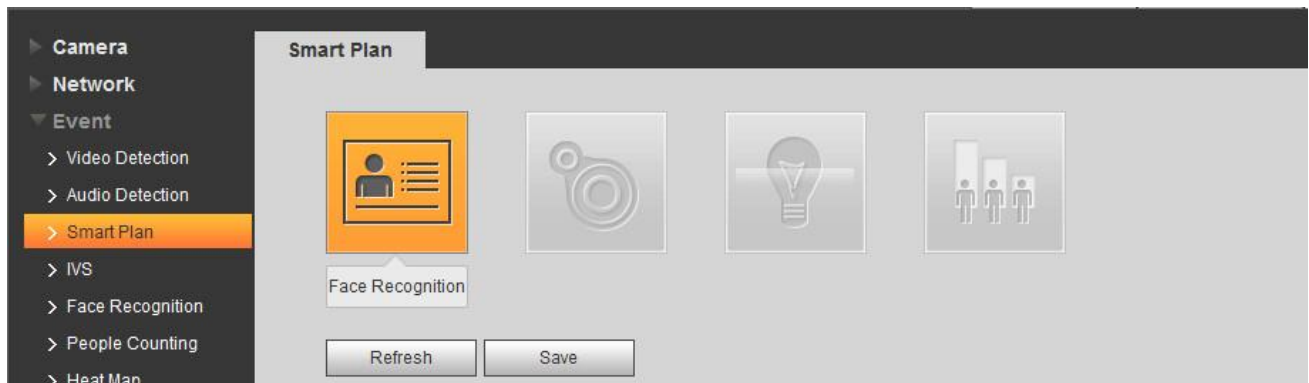


Table 5-11 Enable “Face Recognition” in Smart Plan

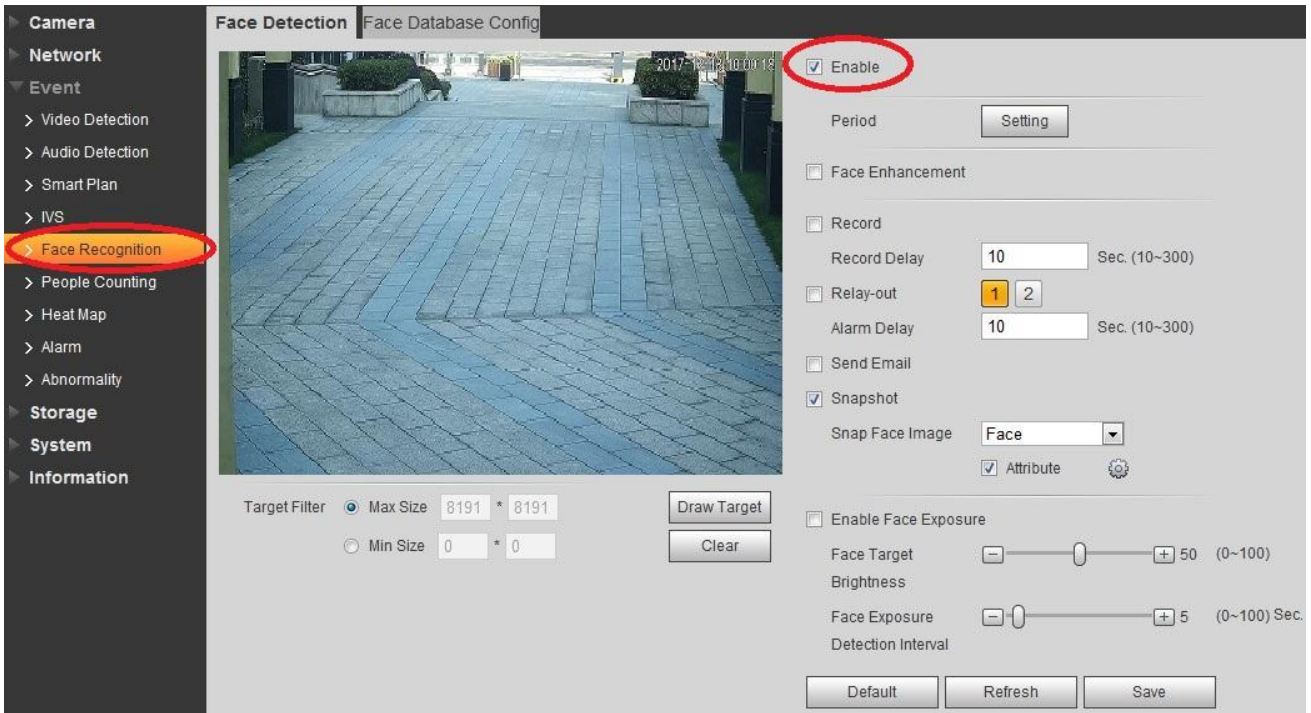


Table 5-12 Enable “Face Recognition” Function

- 2) Face database configuration operation steps:
 - a) Select “Add Face” and then click “More Info”.

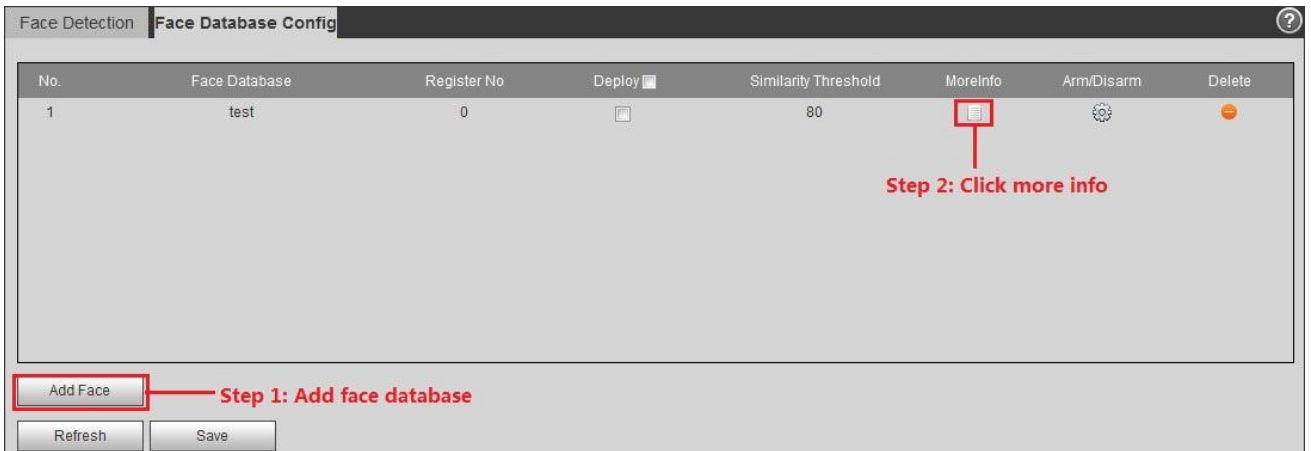


Table 5-13 Face Database Configuration

- b) Registration mode



Table 5-14 Register Face Database

c) Face naming format, e.g., Jack#S1#B19910726#T1#M123456789.jpg

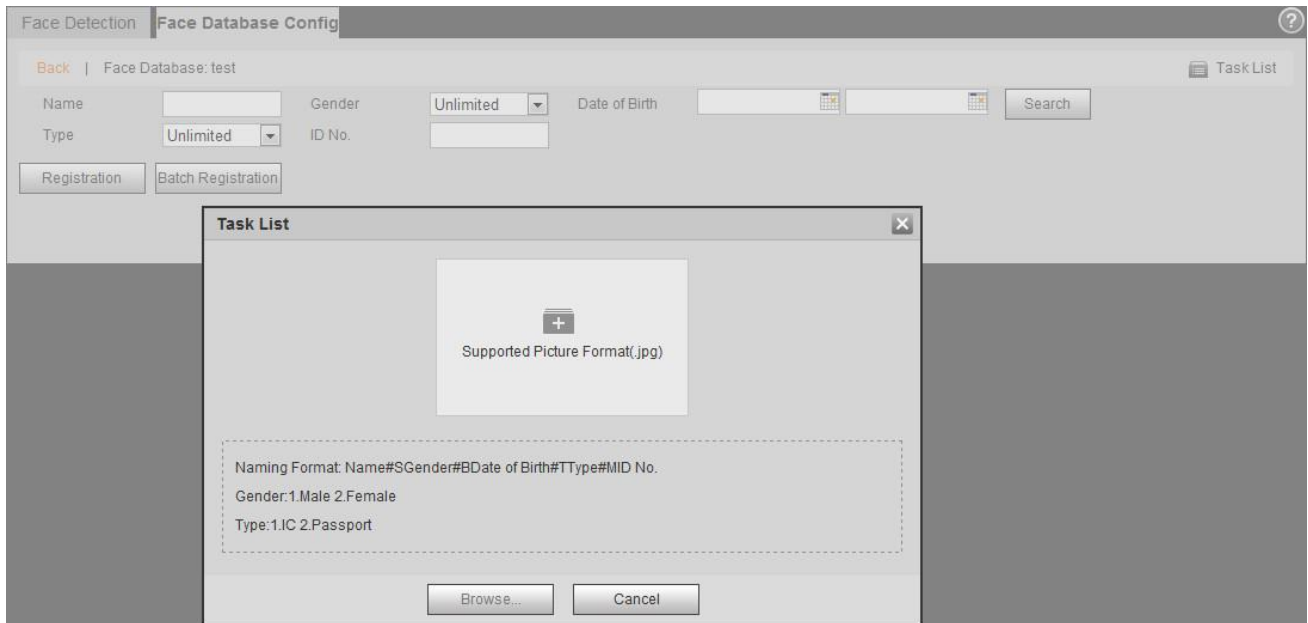


Table 5-15 Face Database Naming Format

- 3) Other configuration requirements for FR camera:
 - a) Face database picture: size <150K, format is jpg
 - b) Similarity is recommended to set 80-90%, it will affect recognition result if it is too low or too high.

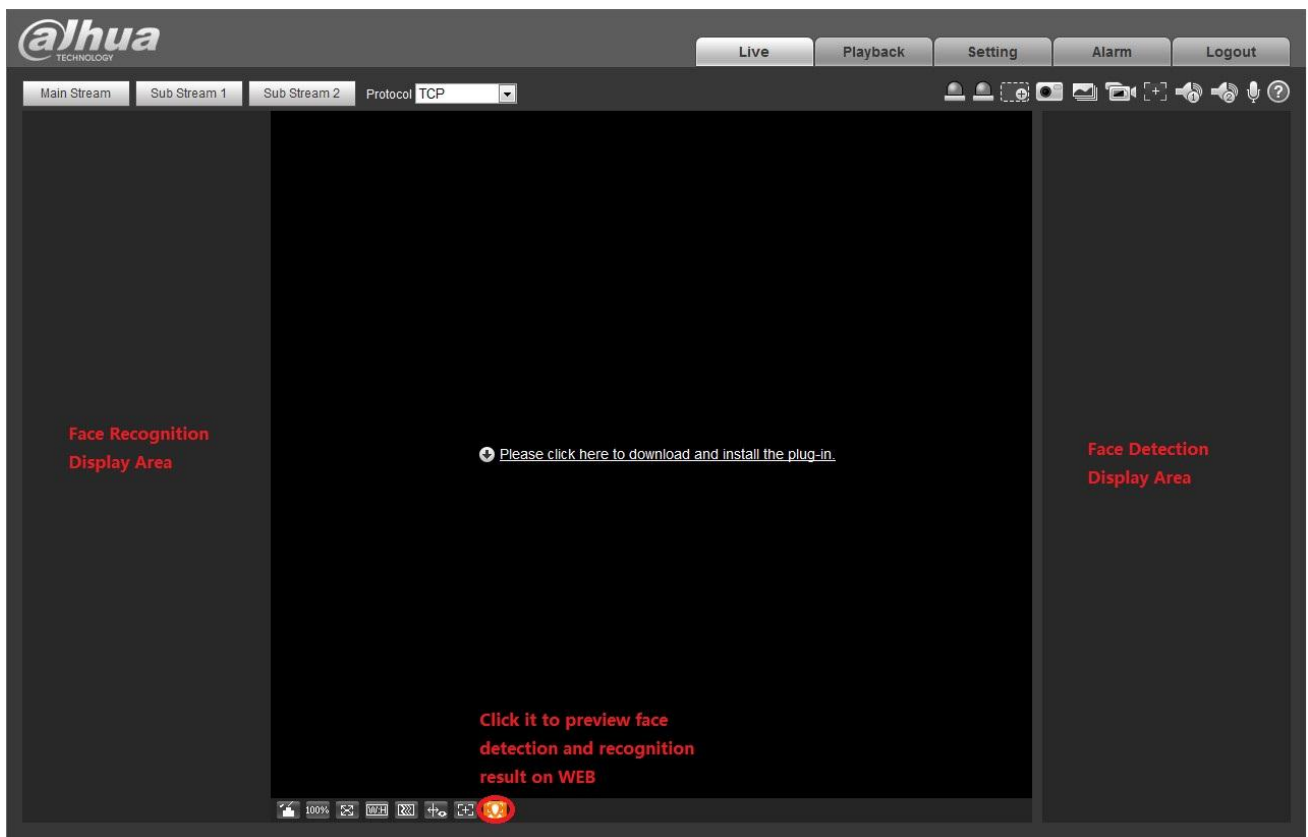


Table 5-16 Recognition Result on the Web Live Interface

5.5.2 HF8242F-FD Face Detection Function Configuration

- 1) Enable “Face Detection” smart plan on Web, meanwhile it is to enable the function of “Face Detection”.

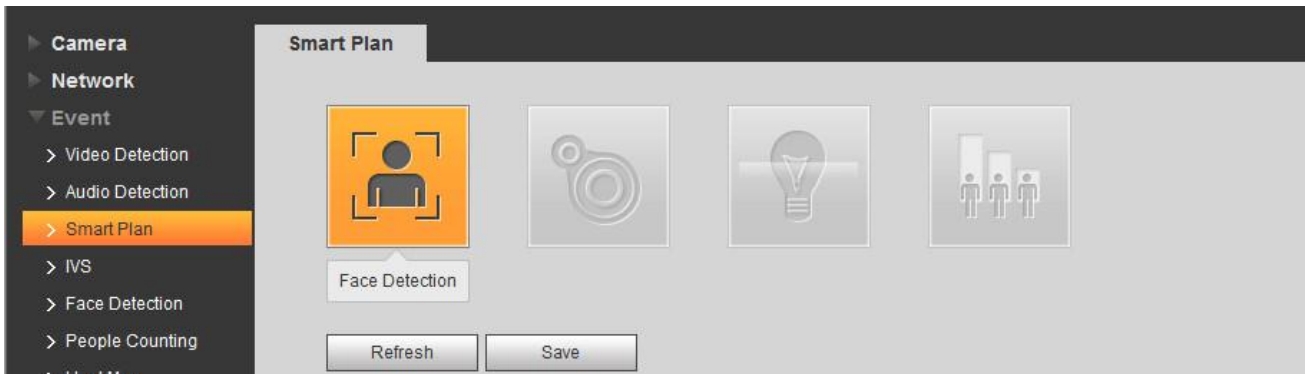


Table 5-17 Enable “Face Detection” in Smart Plan

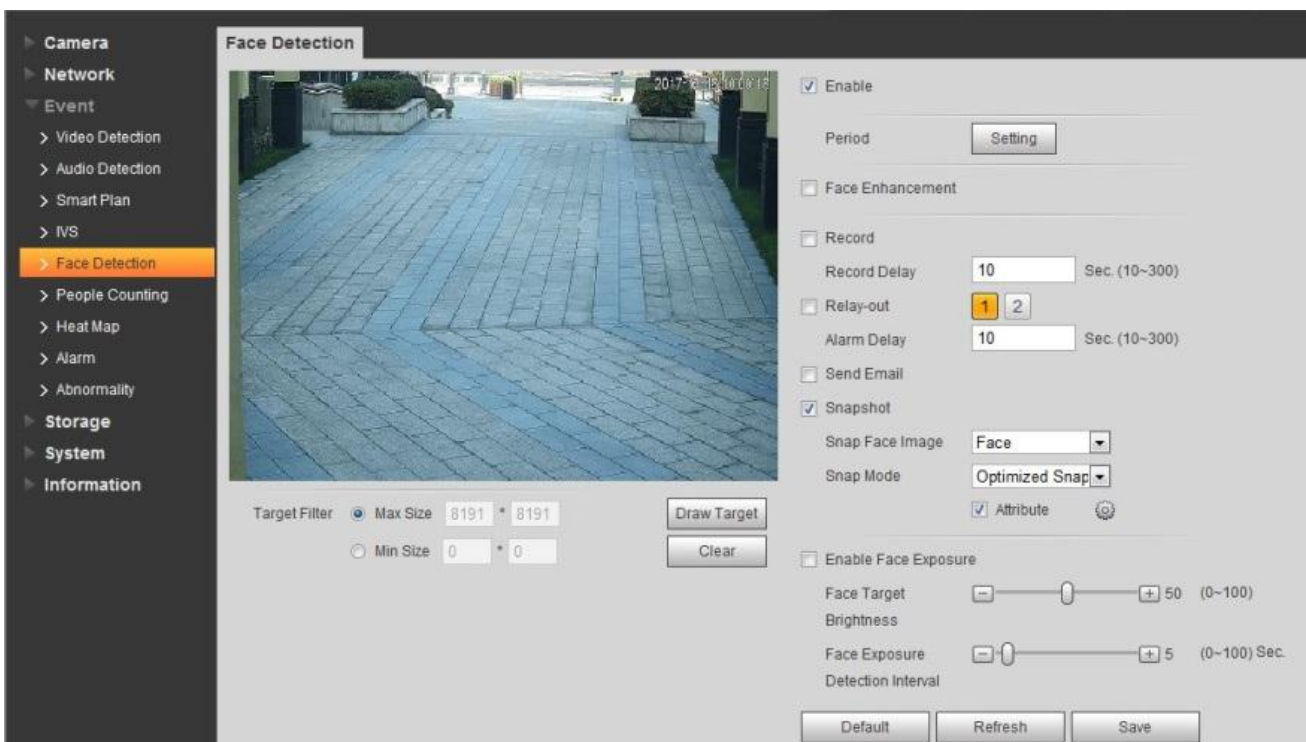


Table 5-18 Enable “Face Detection” Function

- 2) Preview face detection result on Web.

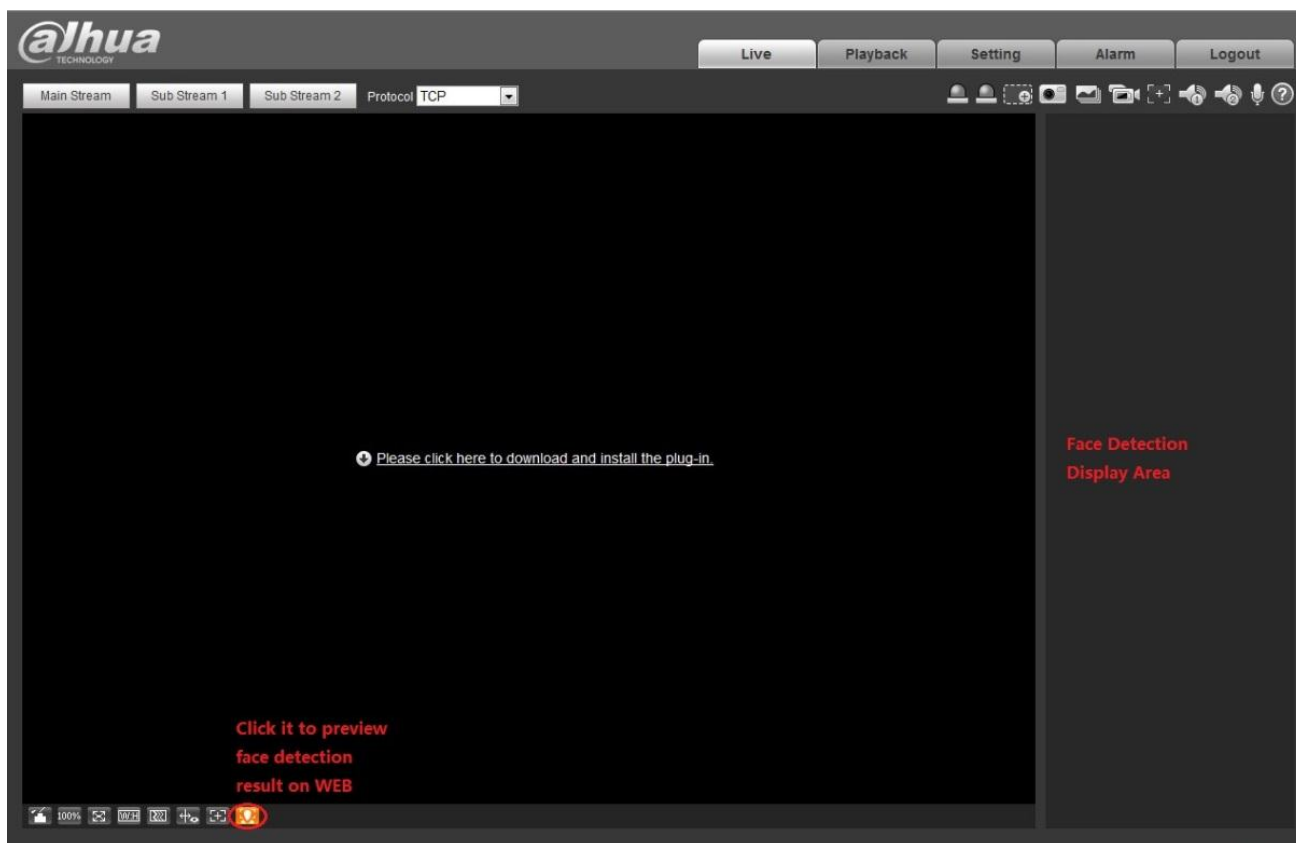


Table 5-19 Face Detection Result on the Web Live Interface

6 Heat Map

6.1 Function Description

It supports statistics of people accumulated density in the time range which has been set, and use different colors to present in the space. The color level is divided into red, orange, yellow, green and blue, which means the people density ranges from high to low. Red means the accumulated density is big and blue means the accumulated density is small, which is shown in Table 6-1.

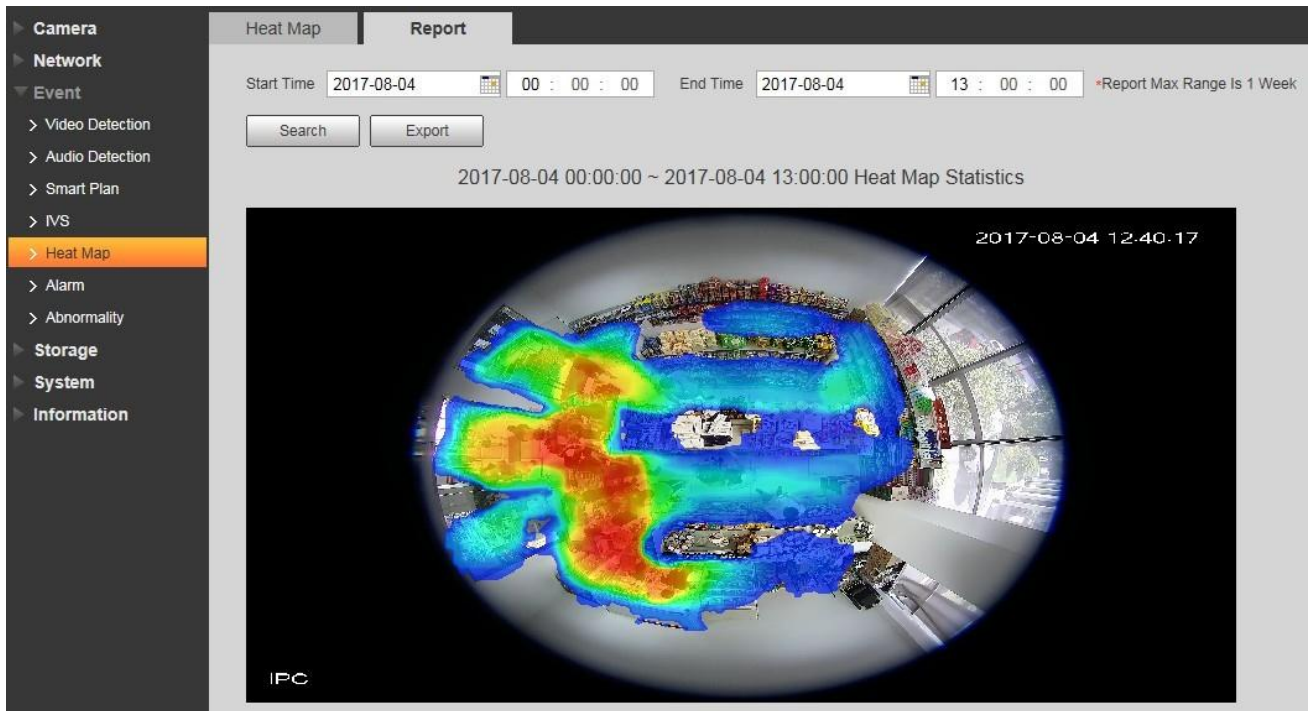


Table 6-1 Heat Map

6.2 Configuration

Log in web → Setup → Event → Heat Map (refer to Table 6-2)

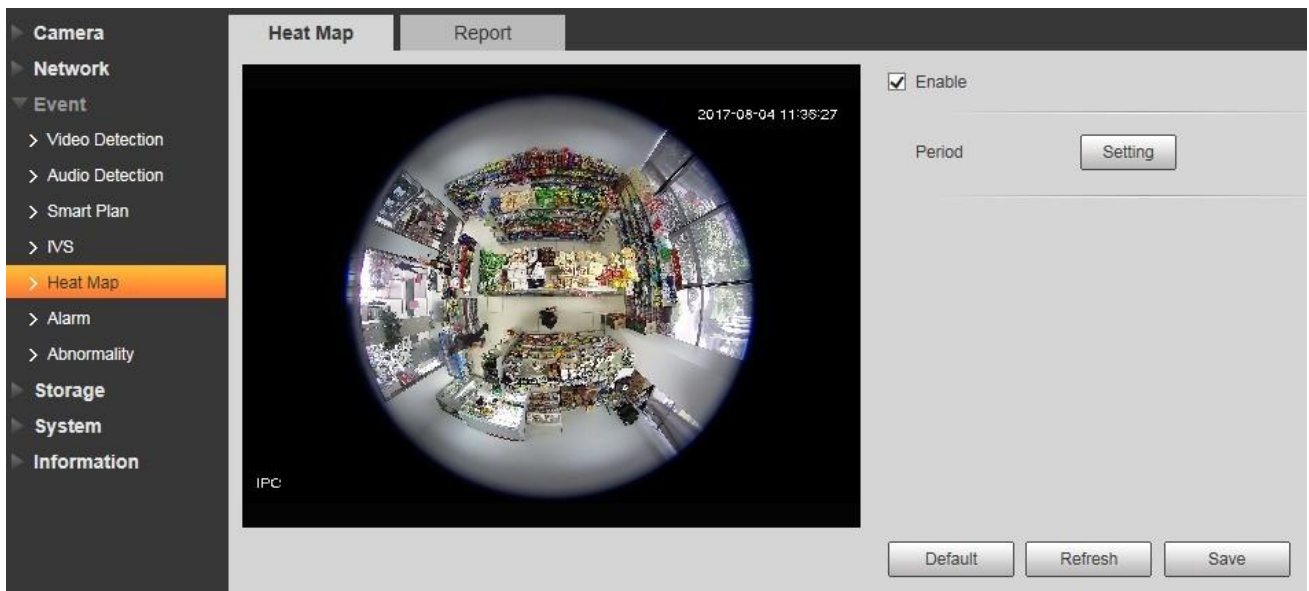


Table 6-2 Heat Map Configuration

6.3 Optional Functions

- 1) Working period setting, it is full day by default.
- 2) Enter report, click search, and click export to export data picture (note: data is stored by the unit of

hour)

Note: Currently heat map function only supports heat map data for 7 days, it will be covered by cycle of hour after it exceeds 7 days. The previous heat map data will be cleared if it is to set flip mode. The active data generated in other periods except the working period will not be accumulated.

7 Flip Mode

7.1 Function Description

The function is generally used indoors, customers will focus more on the monitoring range. For example, if it is installed inside the room, they will focus more on horizontal angle. However, they will focus more on the vertical distance if it is installed in the corridor. IPC is equipped with flip more, which can be used to optimize both horizontal and vertical monitoring angle.

Example:

Horizontal is bigger than vertical for the default output scene range, it is just a flat rectangular view scene, which is shown in Table 7-1.



Table 7-1 Typical Corridor Scene

In this narrow but long scene which is similar to corridor, generally there is no monitoring requirements on both left and right sides (such as corridor, it is generally wall), usually the vertical distance is required, which is to increase the upward, downward and distant monitoring area, which is shown in Table 7-2.



Table 7-2 Corridor Mode (Flip 90°)

7.2 Configuration

Log in web → Setup → Camera → Conditions → Picture → Flip

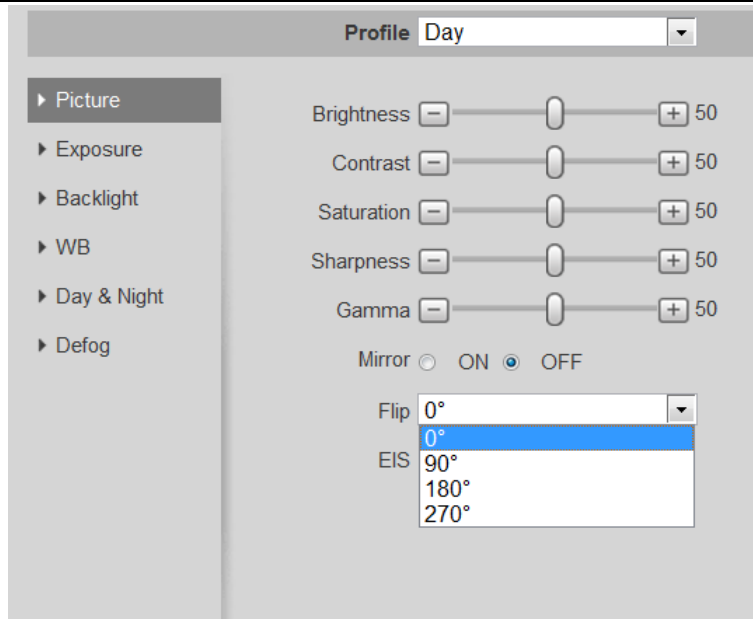


Table 7-3 Flip Mode Configuration

8 EIS

8.1 Function Description

It is to make motion compensation upon the current frame via estimating motion vector of the current frame and according to about 10% of the image, which is to reach the purpose of stabilizing image sequence and effectively reduce or even remove image jittering.

8.2 Configuration

Log in web → Setup → Camera → Conditions → Picture → EIS(ON/OFF)

8.3 Attentions

- 1) After EIS is enabled, the view range of four image sides will be reduced about 10%, refer to Table 8-1 for more details.
- 2) After EIS is enabled, you can see jittering to the image edge in the dynamic scene.



Table 8-1 EIS Effect

9 Defog

9.1 Function Description

It is to realize image defog function via enhancing image contrast algorithm, which can be applied to fog and haze weather.

9.2 Configuration

Log in web → Setup → Camera → Defog(Off/Auto/Manual)



Defog OFF



Defog ON

Table 9-1 Defog Effect

9.3 Attentions

BLC mode is invalid after defog mode is enabled.

10 Triple Streams

10.1 Function Description

It supports independent coding and output for three streams.

10.2 Configuration

Log in web → Setup → Video → Main Stream/Substream 1/Substream 2

10.3 Attentions

Substream 2 is disabled by default.

11 ROI

11.1 Function Description

In a designated region, it can allow compression and encoding with higher image quality, every encoding macro block has specific image quality value in H.264 encoding mode, and the value represents the image definition of the macro block. The macro block included in the region which is set by users is higher than the quality value of other regions, therefore it will realize optimal definition.

Advantages:

- Reduce network pressure, in the same network bandwidth, lower single channel bit rate to transmit more stream channels.
- Reduce storage pressure, with the same storage space, lower single channel bit rate to store longer video.

11.2 Configuration

Log in web → Setup → Video → ROI(Enable/disable and select levels)

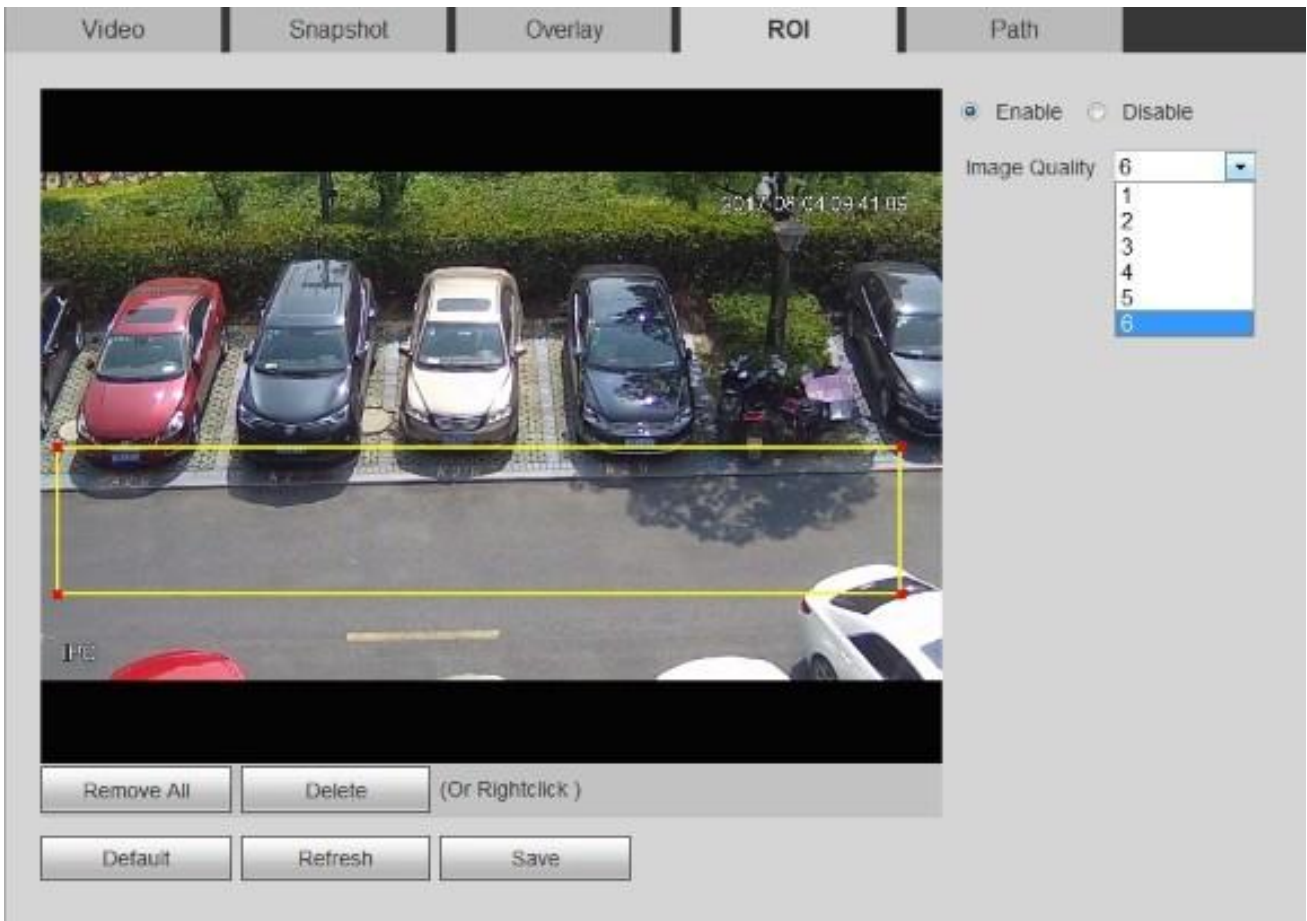


Table 11-1 ROI Configuration

11.3 Attentions

- 1) ROI is a set of Configuration for triple streams.
- 2) ROI can draw max 4 regions, and share a set of level(1~6) Configuration.
- 3) In high bit rate, good image quality, ROI improvement is not obvious when ROI is enabled or disabled.
- 4) In low bit rate, when ROI is enabled, ROI image quality is improved more obviously than when ROI is disabled, loss exists in the non ROI area.

12 Defocus Detection

12.1 Function Description

Defocus function can be used to detect if the video image becomes blurry because the lens imaging defocuses, it will activate alarm according to the judgment results.

12.2 Configuration

Log in web → Setup → Event → Video Detection → Video Tampering → Enable Defocus Detection

Table 12-1 Defocus Detection Configuration

12.3 Attentions

Currently it can't definitely judge if the image is clear, users need to designate in the operation.

- 1) If the users disable defocus detection first and then enable it, then the image is clear at this switching point by default, later on the detection is based on this.
- 2) If there is auto focus function, the current image is clear by default after auto focus is completed, later on the detection is based on this.
- 3) If there is rolling bar to drag focus, and the image is much clearer than the one after auto focus is completed, it is to make detection on the base of the image which has been currently adjusted manually.

13 Audio

13.1 Function Description

Environment noise filter: it can filter and remove the white noise in the background.

For volume setup and adjustment, it is the input volume of Audio in/Mic, the output volume of Audio out is set and adjusted by the speaker.

13.2 Configuration

Log in web → Setup → Audio → Condition

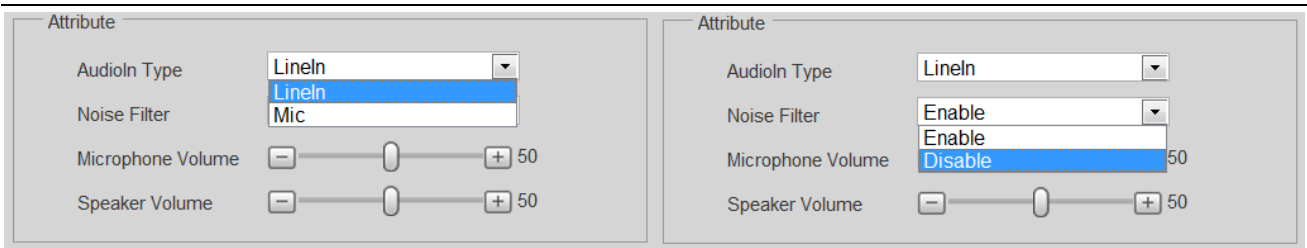


Table 13-1 Audio Configuration

13.3 Attentions

It needs to pay attention to the following matters when using audio functions in order to avoid causing noise.

- 1) Adopt the power with three-phase power port to connect to the device;
- 2) There are only three ports for pickup, which are power, ground and audio output, pickup power needs to be connected to device power, pickup audio output is connected to device audio input, and meanwhile the pickup ground and device audio ground are connected together.

For the problem of howling, it needs to pay attention to the following matters when using device audio function:

- 1) Control the distance between pickup and voice box, reduce acoustic echo.
- 2) Reduce the gain of pickup or voice box.
- 3) Adopt half-duplex communication of interphone.
- 4) Adopt professional echo cancellation device.

14 Audio Detection

14.1 Function Description

It is mainly about the abnormal detection intensity change of no sound source input and current sound; It is about the sudden scream remind. It is to acquire the value via calculating the audio energy and frequency, it can trigger audio detection when EP value > sensitivity/threshold.

14.2 Configuration

Log in web → Setup → Event → Audio Detection

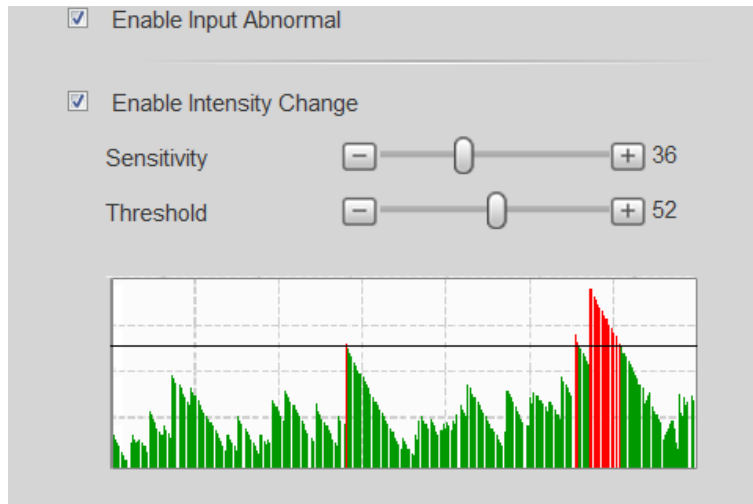


Table 14-1 Audio Detection Configuration

14.3 Attentions

- 1) Sensitivity is about the setting of audio input abnormality.
- 2) It is about intensity change when setting threshold value. Sonogram is real time. It will generate alarm when ΔE_p value $>$ threshold and it displays red; It won't generate alarm when ΔE_p value $<$ threshold.

15ABF

15.1 Function Description

The box cameras support ABF function, and it can use one button to slightly adjust focal length.

15.2 Configuration

- 1) From back panel: operate the ABF button on the back panel of the bullet, see the following figures.

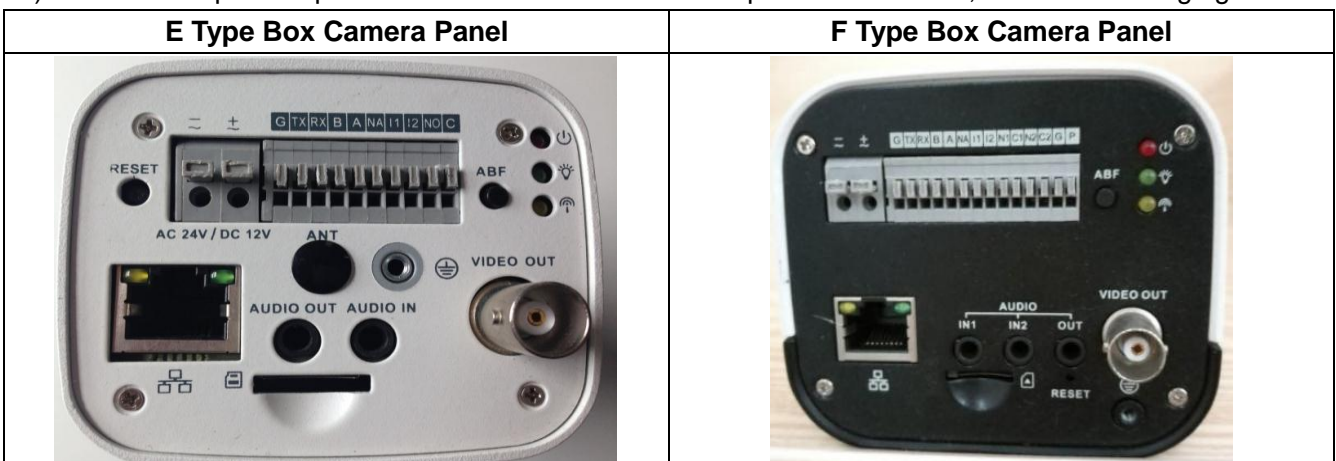



Table 15-1 Box Camera Back Panels

- 2) From web: Log in web → Live → left lower corner  → auto focus

15.3 Attentions

The range of back focal length is very short, which is only 2mm to be adjusted. The precondition of using ABF is to manually adjust lens till the image is clear.

16 Tripwire

16.1 Function Description

Tripwire is used to detect that some sensitive areas can't be casually tripped in the monitoring scene, the device will trigger alarm if the target object trips the detection line.

16.2 Test Point Requirements

- 1) Installation Height
Try to make the camera view angle have a certain depression angle, which is generally bigger than 20 °; Try to avoid mutual block between targets due to horizontal view and cause false alarm and leakage alarm; The camera indoor installation height is no lower than 3 meters, generally it is recommended that the outdoor installation height is between 5 and 10 meters; If the camera is applied in the fence scenario, the camera height has to be higher than the fence. The camera has to be installed stably, which is to avoid waggle to affect analysis effect.
- 2) Target size
The total proportion of the target can't be more than 10%, the size is no less than 10*10 pixel (CIF image) in the image, The height and width of the target can't exceed 1/3 of the image; it is recommended that the target height is about 10% of the image height.
- 3) Movement Track
Try to make the monitoring direction vertical with the movement direction of the target, which is to make the target displacement more obvious and make it more convenient for detection, meanwhile it has to guarantee that the detection target continuously appears within the view for more than 2 seconds, movement distance has to exceed the width of the target itself and it does cross the detection line. The detection area shall not be blocked, the movement buffer zones on both sides of the warning line can't be too small, which is to avoid the detection target rushing out the image too fast.
- 4) Background & Light
 - a) Try to avoid backlight installation for the test device, and sky is not recommended to appear in the image, otherwise it may lead to over brightness or partial over darkness for the image, which is not good for detection. The brightness value difference between detection target and background is no less than 10 grey levels.
 - b) Try to lower the complexity of monitoring scene if possible. It is not advised to apply intelligent

functions in the scenario where the targets are dense and light change is very frequent; Try to keep away from the reflection areas such as windows, ground and water surface etc.; try to keep away from the branches, shadow, mosquito disturbance area. It is recommended to make the distance between compensation lamp and test device more than 2 meters if it needs to use compensation lamp.

16.3 Configuration

Log in web → Setup → Event → IVS → Tripwire (refer to Figure 16-1)

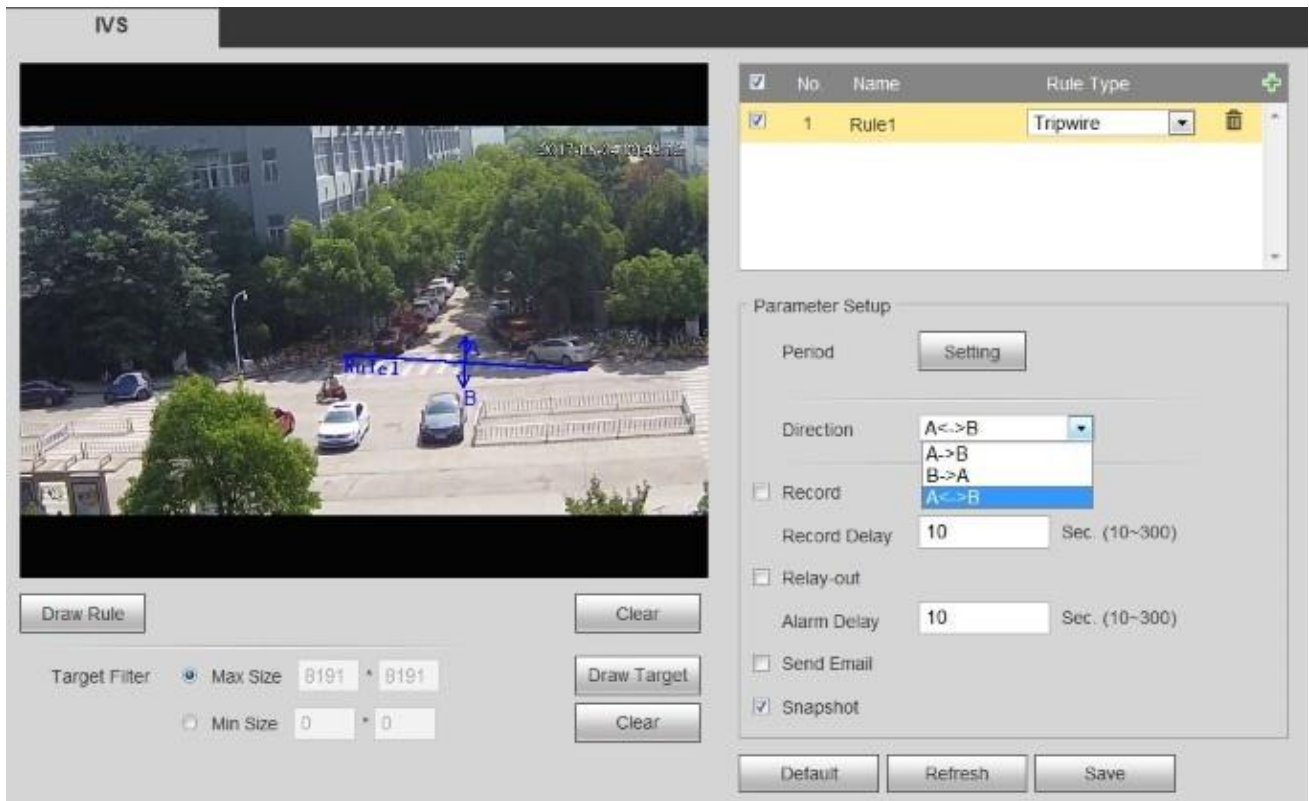


Figure 16-1 Tripwire Configuration

16.4 Optional Functions

- 1) Working period setting, it is full day by default.
- 2) Supports alarm linkage setting: record, relay out, send email and snapshot.
- 3) Target filter can set max and min target, which means the max and min target which can be detected.

17 Intrusion

17.1 Function Description

Intrusion is used to detect that some sensitive areas can't be casually entered, exited or crossed in the

monitoring scenario, it will trigger device alarm if the target object touches the detection line.

17.2 Test Point Requirements

1) Installation Height

Try to make the camera view angle have a certain depression angle, which is generally bigger than 20° ; Try to avoid mutual block between targets due to horizontal view and cause false alarm and leakage alarm; The camera indoor installation height is no lower than 3 meters, generally it is recommended that the outdoor installation height is between 5 and 10 meters; If the camera is applied in the fence scenario, the camera height has to be higher than the fence. The camera has to be installed stably, which is to avoid wobble to affect analysis effect.

2) Target size

3) The total proportion of the target can't be more than 10%, the size is no less than 10×10 pixel (CIF image) in the image, The height and width of the target can't exceed $1/3$ of the image; it is recommended that the target height is about 10% of the image height.

4) Movement Track

Try to make the monitoring direction vertical with the movement direction of the target, which is to make the target displacement more obvious and make it more convenient for detection, meanwhile it has to guarantee that the detection target continuously appears within the view for more than 2 seconds, movement distance has to exceed the width of the target itself and it does cross the detection line. The detection area shall not be blocked, the movement buffer zones on both sides of the warning line can't be too small, which is to avoid the detection target rushing out the image too fast.

5) Background & Light

- a) Try to avoid backlight installation for the test device, and sky is not recommended to appear in the image, otherwise it may lead to over brightness or partial over darkness for the image, which is not good for detection. The brightness value difference between detection target and background is no less than 10 grey levels.
- b) Try to lower the complexity of monitoring scene if possible. It is not advised to apply intelligent functions in the scenario where the targets are dense and light change is very frequent; Try to keep away from the reflection areas such as windows, ground and water surface etc.; try to keep away from the branches, shadow, mosquito disturbance area. It is recommended to make the distance between compensation lamp and test device more than 2 meters if it needs to use compensation lamp.

17.3 Configuration

Log in web → Setup → Event → IVS → Intrusion (refer to Figure 17-1)

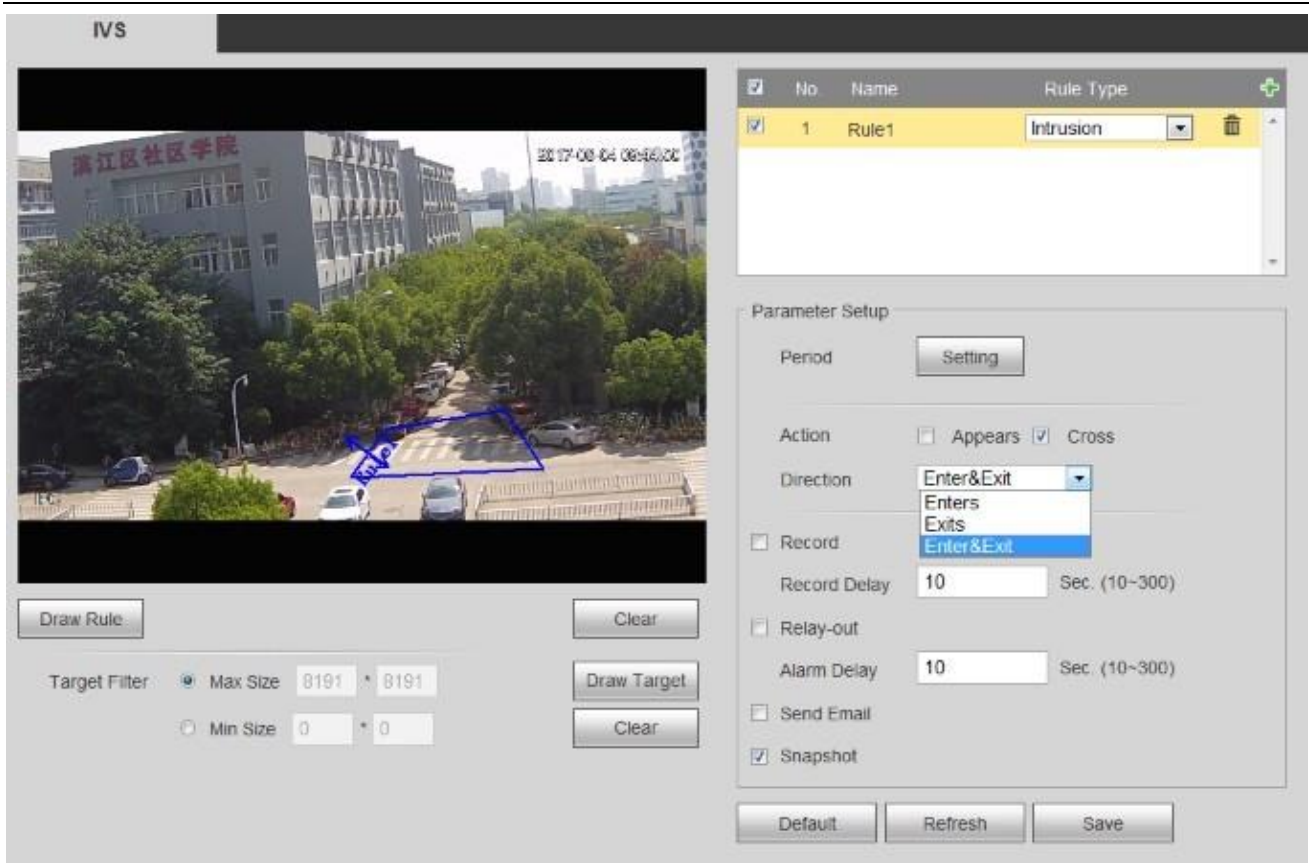


Figure 17-1 Intrusion Configuration

17.4 Optional Functions

- 1) The function is related to two intelligent behaviors: appears and cross. Appears means it will trigger alarm when the target appears in the designated area and within the alarm time which has been set; Cross means it will trigger alarm when the target crosses (enters or exits) the area in the designated area and within the alarm time which has been set.
- 2) Working period setting, it is full day by default.
- 3) Supports alarm linkage setting: record, relay out, send email and snapshot.
- 4) Target filter can set max and min target, which means the max and min target which can be detected.

18 Abandoned Object/Missing

18.1 Function Description

Abandoned object/missing function is used to detect if there is people, vehicle and objects abandoned or missing in some areas in the monitoring scenario; it will trigger alarm when the target object stays or misses for some time which exceeds the regulated time.

18.2 Test Point Requirements

1) Installation Height

Try to make the camera view angle have a certain depression angle, which is generally bigger than 20 °; Try to avoid mutual block between targets due to horizontal view and cause false alarm and leakage alarm; The camera indoor installation height is no lower than 3 meters, generally it is recommended that the outdoor installation height is between 5 and 10 meters; If the camera is applied in the fence scenario, the camera height has to be higher than the fence. The camera has to be installed stably, which is to avoid waggle to affect analysis effect.

2) Target size

The total proportion of the target can't be more than 10%, the size is no less than 10*10 pixel (CIF image) in the image, The height and width of the target can't exceed 1/3 of the image; it is recommended that the target height is about 10% of the image height.

3) Movement Track

Try to make the monitoring direction vertical with the movement direction of the target, which is to make the target displacement more obvious and make it more convenient for detection, meanwhile it has to guarantee that the detection target continuously appears within the view for more than 2 seconds, movement distance has to exceed the width of the target itself and it does cross the detection line. The detection area shall not be blocked, the movement buffer zones on both sides of the warning line can't be too small, which is to avoid the detection target rushing out the image too fast.

4) Background & Light

a) Try to avoid backlight installation for the test device, and sky is not recommended to appear in the image, otherwise it may lead to over brightness or partial over darkness for the image, which is not good for detection. The brightness value difference between detection target and background is no less than 10 grey levels.

b) Try to lower the complexity of monitoring scene if possible. It is not advised to apply intelligent functions in the scenario where the targets are dense and light change is very frequent; Try to keep away from the reflection areas such as windows, ground and water surface etc.; try to keep away from the branches, shadow, mosquito disturbance area. It is recommended to make the distance between compensation lamp and test device more than 2 meters if it needs to use compensation lamp.

18.3 Configuration

Log in web → Setup → Event → IVS → Abandoned Object/Missing (refer to Figure 18-1 and Figure 18-2)

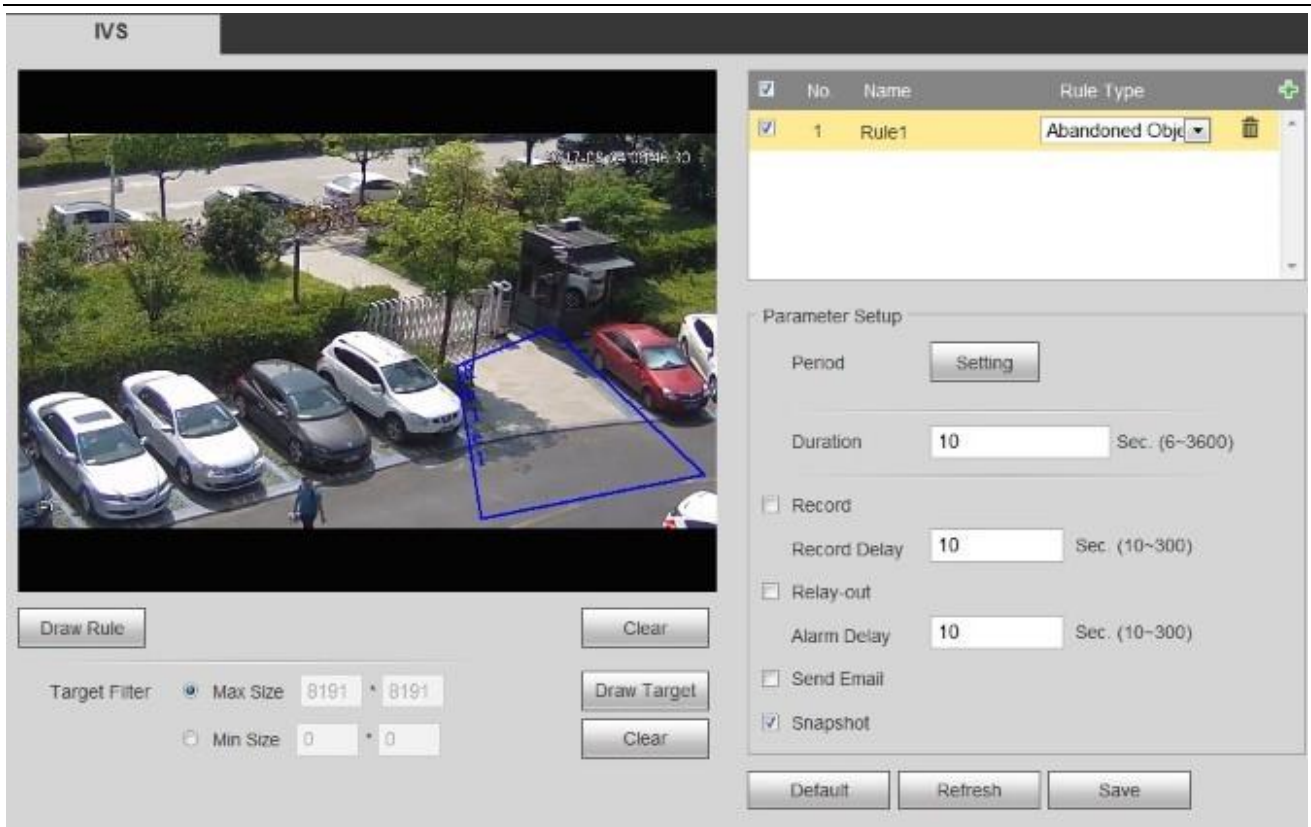


Figure 18-1 Object Abandoned Configuration

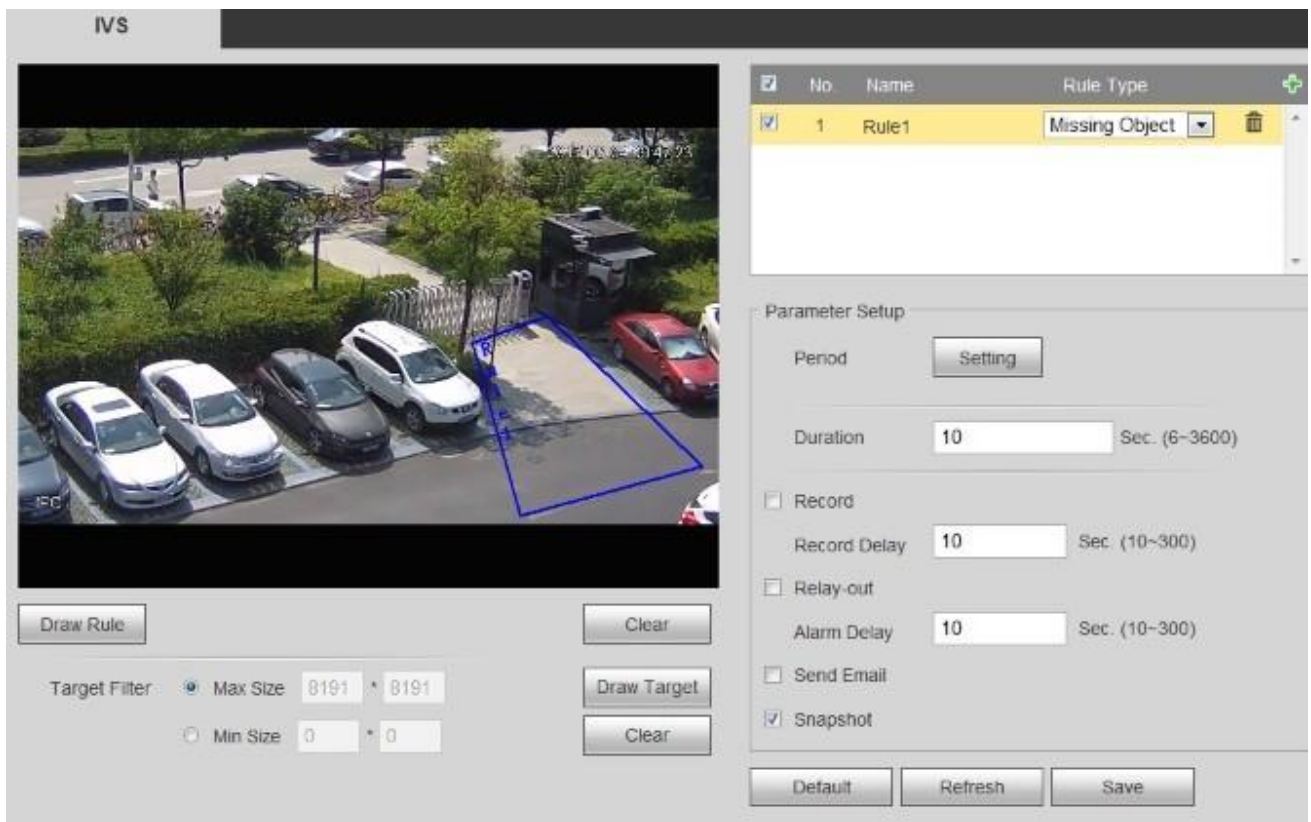


Figure 18-2 Object Missing Configuration

18.4 Optional Functions

- 1) Set shortest keep time, which means the time from when the target is abandoned or missed to when it triggers alarm
- 2) Working period setting, it is full day by default.
- 3) Supports alarm linkage setting: record, relay out, send email and snapshot.
- 4) Target filter can set max and min target, which means the max and min target which can be detected.

18.5 Attentions

The system will make statistics about the still areas in the foreground area, and distinguish abandoned object from missing object according to the similarity of foreground and background, it will trigger alarm when it exceeds the time which has been set by users. Abandoned object and missing object can be wrongly distinguished when both foreground and background are very complicated. It also triggers abandoned alarm when pedestrians or vehicles stay still for a longer time. In order to filter such kind of alarm, generally the abandoned object is smaller than people and vehicle, so it can filter people and vehicles via setting size. Besides, it can also properly extend alarm time to avoid false alarm of abandoned object when people stay for a short time.

19 Scene Changing

19.1 Function Description

Scene change function is used to detect abnormality of monitoring scene, such as camera being blocked, moved, intense light change and so on. The intelligence library will make comparison between the original picture and the picture of the camera which has been blocked or moved, and judge if there is similarity; it will generate alarm if there is no matched similarity

19.2 Test Point Requirements

- 1) Avoid using the scene with big image brightness difference after the light is turned on and off.



- 2) It also needs some reference area with fixed texture and not being blocked by moving object in the scene;
- 3) As the scene shown in the lower left picture, it is easy to generate false alarm because the moving crowd covers most of the image and there is no fixed area for reference, which makes it inconvenient to be scene change detection; as the scene shown in the lower right picture, there is ceiling and wall used as reference areas besides the moving crowd, which is suitable for analysis.



- 4) Avoid using in the tunnel, avoid using it the place where there is great car lamp disturbance.



19.3 Configuration

Log in web → Setup → Event → Video Detection → Scene Changing (refer to Figure 19-1)



Figure 19-1 Scene Changing Configuration

19.4 Optional Functions

- 1) Working period setting, it is full day by default.

- 2) Supports alarm linkage setting: record, relay out, send email and snapshot.

20FAQ

1. How long does it need to learn intelligence library background by default?
The time of background study is around 16 seconds.
2. Can tripwire be used as a target counter?
No. It can't be used as accurate counting because it fails to split the adhesive targets.
3. For abandoned object, illegal parking, how does algorithm judge people, vehicle and object?
Currently intelligence library can only have people/vehicle type, the judgment of object is not correct; therefore for the abandoned object, people who are still for a long time or the stopped vehicles, it will generate alarm in the default Configuration. It is advised to increase alarm time if it needs to filter the disturbance of still people, generally it is over 30 seconds; If it only needs to generate alarm for the small objects, filter the disturbance of people and vehicle, it can be realized via setting size. Abandoned detection can also realize illegal parking function, it can set size to filter in order to distinguish vehicle from object.