DH Network Camera (4MP WizMind Dual-Lens Network Camera) (HDW8441XP-3D)

Installation and Configuration Instruction Manual

ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD. V1.0.1

Foreword

This manual introduces the installation and commissioning of 4-MP WizMind Dual-Lens Network Camera (hereinafter referred to as "the camera"), to effectively use the people counting function. Some parameters and functions are not described in details. For details, see the user's manual and other supporting documents.

Safety Instructions

The following signal words 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, reductions in performance, or unpredictable results.
TIPS	Provides methods to help you solve a problem or save time.
NOTE	Provides additional information as a supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.0.1	Add PPM calculation formula and control data PPM value	August 2023
V1.0.0	First release.	May 2022

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, fingerprints, and license plate number. You need to be in compliance with your local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures which include but are not limited: Providing clear and visible identification to inform people of the existence of the surveillance area and provide required contact information.

About the Manual

The manual is for reference only. Slight differences might be found between the manual and the product.

We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.

The manual will be updated according to the latest laws and regulations of related jurisdictions. For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or visit our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.

All designs and software are subject to change without prior written notice. Product updates might result in some differences appearing between the actual product and the manual. Please contact customer service for the latest program and supplementary documentation.

There might be errors in the print or deviations in the description of the functions, operations and technical data. If there is any doubt or dispute, we reserve the right of final explanation.

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Please visit our website, contact the supplier or customer service if any problems occur while using the device.

If there is any uncertainty or controversy, we reserve the right of final explanation.

Table of Contents

Overview

Introduction

This manual mainly introduces the installation and commissioning of 4-MP WizMind Dual-Lens Network Camera (HDW8441 series).

With adaptive height function, the camera can be adapted to the installation height and angle to improve the detection effect of people counting in ceiling mount.

With the built-in GPU chip, the camera supports deep learning algorithms, which improves the detection accuracy.

Easily switches AI resources among people counting, IVS, and face detection.

Supports triple stream and 2-channel HD video display.

Adopts high-performance starlight 4-MP 1/3-inch CMOS image sensor to ensure high image definition in low illumination.

Outputs maximum 4 MP (2560 × 1440)@25 fps videos.

Supports H.265 encoding, which allows high compression ratio and transmission with less stream.

Model Selection

The following table is for reference only. For latest product models, see market promotion materials.

Select models

External Model	Internal Model	Appearance	Name	Feature
DH-IPC-HDW8441X-3D	DH-IPC-HDW8441XP-3D-0200B		Dahua 4-MP WizMind Dual-Lens Network Camera	With adaptive height function, the camera can be adapted to the installation height and angle to improve the detection effect of people counting in ceiling mount. Easily switches AI resources among people counting, IVS, and face detection.
DH-IPC-HDW8441X-3D	DH-IPC-HDW8441XP-3D-0280B			
IPC-HDW8441X-3D	IPC-HDW8441XP-3D-0200B		General 4-MP WizMind Dual-Lens Network Camera	

External Model	Internal Model	Appearance	Name	Feature
IPC-HDW8441X-3D	IPC-HDW8441XP-3D-0280B			With the built-in GPU chip, the camera supports deep learning algorithms. Adopts high-performance starlight 4-MP 1/3-inch CMOS image sensor to ensure high image definition in low illumination.

Site Survey and Installation

People Counting

This section introduces people counting of HDW8441 series.

Site Requirements

The following requirements must be met before using AI functions.

Site requirements

No.	Type	Requirements	Remarks
1	Illumination	The lighting on the site must ensure that the people in the image are clearly visible, and the heads and shoulders are clear. When the light is insufficient, such as at night or in cloudy days, illuminators are needed to provide more light.	When the light is poor, the smart detection performance might be affected.
2	Scenarios	Avoid physical obstacles, frequently changing light, backlight, and direct light exposure.	—
3	Installation height	2.5 m–5 m (recommended).	You can adjust installation height according to the actual scenarios, but the pixels must meet the minimum pixel requirements of the algorithm.
4	Installation angle	Ceiling mount: 90°; inclined mount: 30°–80°	The larger the angle, the better the detection effect.
5	Pedestrian direction	Faces the single flow direction.	—

Scenario

Recommended Scenarios

People counting includes three intelligent rules: People counting (tripwire), area people counting, and queuing. For people counting (tripwire) rule, we recommend you adopt ceiling mount or inclined mount; for area people counting and queuing rules, we recommend you adopt ceiling mount, because the image is easily blocked by concentrated crowd.

People counting (tripwire) in ceiling mount scenarios

From left to right: An indoor passage, an entrance and exit, and a security screening passage.

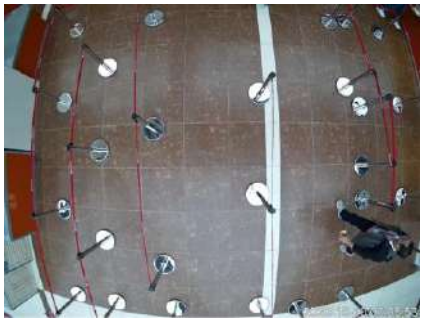
People counting (tripwire) in inclined mount scenarios

From left to right: An indoor passage, and an entrance and exit.

Area people counting in ceiling mount scenarios

From left to right: A bank self-service area, and a duty area.

Queuing in ceiling mount scenarios



A queue area in a canteen.

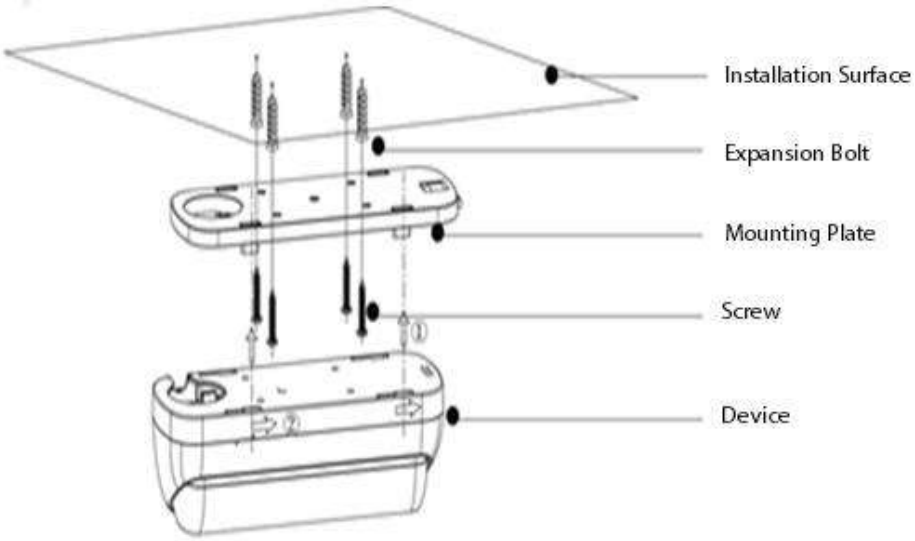
Non-Recommended Scenarios

Too high installation (overlooking from high altitude)

Installation Method

The camera only supports ceiling mount, but you can adjust the lens angle to make it inclined.

Ceiling mount



Installation Height

You can adjust the installation height according to the actual scenarios. We recommend you install the camera at a height of 2.5 m to 5 m above the ground.

The pixels must meet the minimum pixel requirements of the algorithm.

Installation Angle

You can adjust the installation angle according to the actual scenarios. We recommend you install the camera with a depression angle of 30° to 90°, and ensure that the image is level.

The pixels must meet the minimum pixel requirements of the algorithm.

When the lens directly faces the ground (90°), it is ceiling mount; when the angle between the lens and the horizontal plane is 30° to 80°, it is inclined mount.

Arming Data

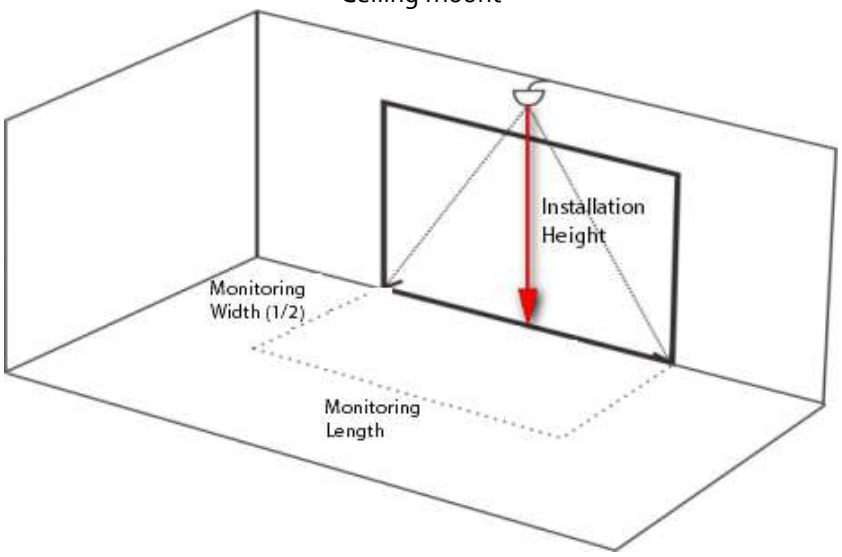
When adopting ceiling mount (90°), the arming area is a rectangle.

When adopting inclined mount (30° to 80°), the arming area is a trapezoid.

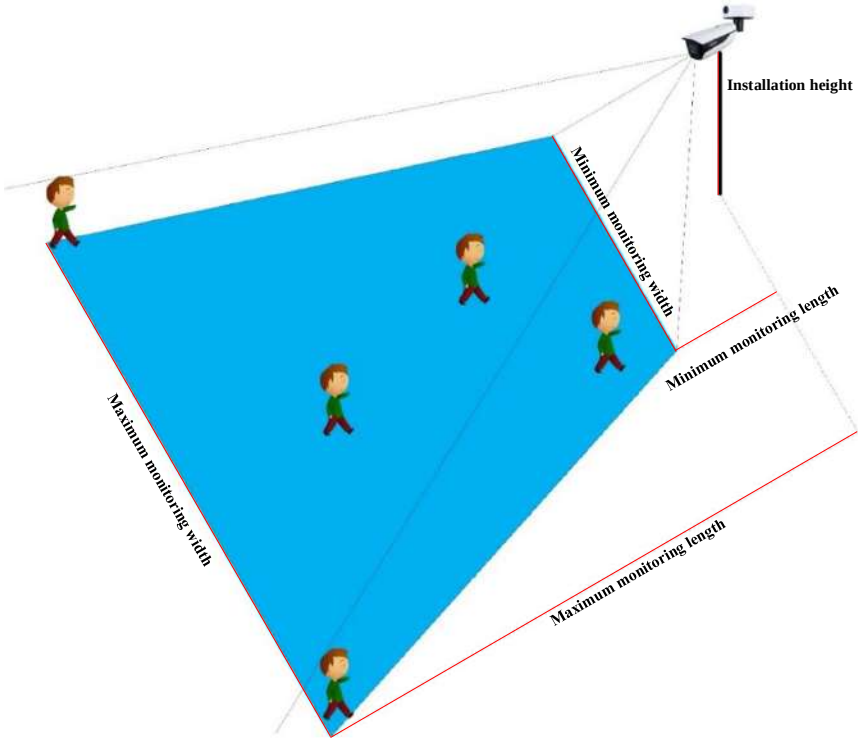
In inclined mount, the minimum arming length requires that the feet are in the image, and the maximum length requires that heads are in the image. The arming width requires that the whole human bodies are in the image and meets the requirements of effective detection width.

Arming Diagram

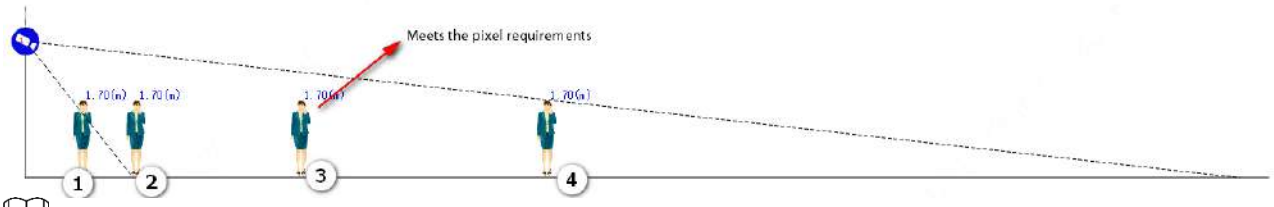
Ceiling mount



Inclined mount



Inclined mount (side view)



When using people counting rules, position 2 is the minimum length point (the feet are in the image). When the pixels of entire monitoring image meet the algorithm requirements, the maximum length point is position 4. Otherwise, the maximum length point is position 3 where the pixels of the head and shoulders meet the algorithm requirements.

Arming Data

Intelligent PPM value calculation formula:PPM=pixel requirement/object width
Example: Face recognition PPM=100/0.15=667

In actual use, you can calculate the arming data by Project Design Tool according to the device model, or send emails to R&D team for arming data.

The tool calculates the data as if there is sufficient amount of illumination by default. If the illumination of the site is poor, the data from the on-site test will not reach the value calculated by the tool. So the test results from the on-site test should be chosen over the results from the tool.

Intelligent detection data is closely related to the installation scenario, light, and other factors. When the installation scenario and light are poor, the intelligent detection data can be improved by adjusting the scenario and adding illuminators. When the scenario and light are better, the detection effect might still be somewhat reduced. The test results from the on-site test should be chosen.

The data in the following table is for reference only. If the actual scenario is different, please chose the test data.

Arming data for ceiling mount (target: shoulder height is 1.5 m; shoulder width is 0.375 m)

Model	Focal Length (mm)	Recommended Pixel	PPM	Installation Angle (°)	Installation Height (m)	Horizontal Arming Range/Monitoring Length (m)	Vertical Arming Range/Monitoring Width (m)
HDW8441XP-3D-0200B	2	100	267	90°	2.5	2.38	1.34
					3	3.49	1.96
					3.5	4.54	2.56
					4	5.54	3.12
					4.5	6.48	3.65
					5	7.37	4.15
HDW8441XP-3D-0280B	2.8	100	267	90°	3	2.38	1.34
					3.5	3.13	1.76
					4	3.85	2.16
					4.5	4.55	2.56
					5	5.22	2.94
					5.5	5.87	3.3
					6	6.5	3.66

Arming data for inclined mount (target: shoulder height is 1.5 m; shoulder width is 0.375 m)

Model	Focal Length (mm)	Recommended Pixel	PPM	Installation Angle (°)	Installation Height (m)	Min. Arming Length (m)	Min. Arming Width (m)	Max. Arming Length (m)	Max. Arming Width (m)
HDW8441XP-3D-0200B	2	100	267	30°	2.5	0.56	2.41	5.61	12
					3	0.89	3.48	5.82	12
					3.5	1.25	4.44	6.04	12
					4	1.61	6.5	6.06	12
					4.5	1.93	6.52	5.83	12
	2	100	267	60°	2.5	-0.06	2.55	2.17	5.66
					3	-0.06	3.48	2.95	7.55
					3.5	-0.06	4.35	3.68	9.25
					4	-0.05	5.18	4.37	10.78
					4.5	-0.03	5.95	4.94	12
HDW8441XP-3D-0280B	2.8	100	267	30°	3	1.16	2.74	8.17	12
					3.5	1.59	3.57	8.35	12
					4	2.04	4.35	8.53	12
					4.5	2.5	5.09	8.71	12
					5	2.99	5.78	8.98	12
					5.5	3.5	6.4	9.1	12
					6	3.94	7.22	8.86	12
	2.8	100	267	60°	3	0.16	2.4	2.08	4.04
					3.5	0.22	3.04	2.64	5.07
					4	0.29	3.65	3.19	6.04
					4.5	0.35	4.25	3.72	6.97
					5	0.43	4.83	4.24	7.85
					5.5	0.59	5.92	5.24	9.48
					6	0.68	6.44	5.72	10.22

Face Detection/IVS

This camera also supports face detection and IVS. For details, see corresponding configuration and commissioning manuals.

Commissioning and Configuration

Preparation

Before the commissioning and configuration, ensure that the following operations have been completed. For details, see the user's manual.

Make sure the camera is connected to the power supply and starts normally.

Make sure the camera is initialized and the basic configuration is completed.

Clear the plug-in of your browser, including clearing the browser's cache and deleting the camera's controls.

Delete the webrec folder under C:\Program Files\webrec or C:\Program Files (x86) \webrec.

Log in to the camera webpage with a browser compatible with the this version.

Configuring People Counting

People counting includes three intelligent rules: People counting (tripwire), area people counting, and queuing.

People counting (tripwire): The system analyzes the number of people that crosses the tripwire. When the number of people exceeds the predefined value, an alarm will be triggered.

Area people counting: You can configure a detection area, and then the system analyzes the number of people that enters and exits the area. When the number of people exceeds the predefined value, an alarm is triggered.

Queuing: You can configure a detection area, and then the system analyzes the queuing situation in the area. When the number of people in the queue and the queuing time exceed the predefined values, an alarm is triggered.

Configuring AI Functions

People Counting (Tripwire)

The system counts the people entering and leaving the detection area. When the number of counted number of people who enter, leave, or stay in the area exceeds the configured value, an alarm is triggered, and the system performs an alarm linkage.

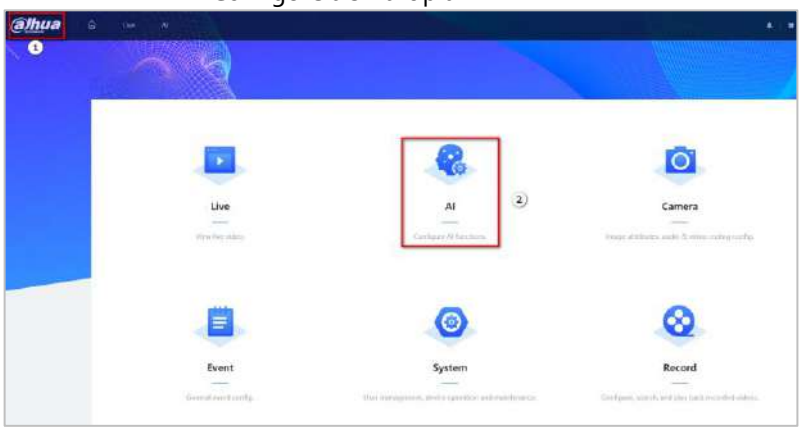
Prerequisite

The global configuration of IVS is completed. For details, see "o Global Configuration".

Procedures

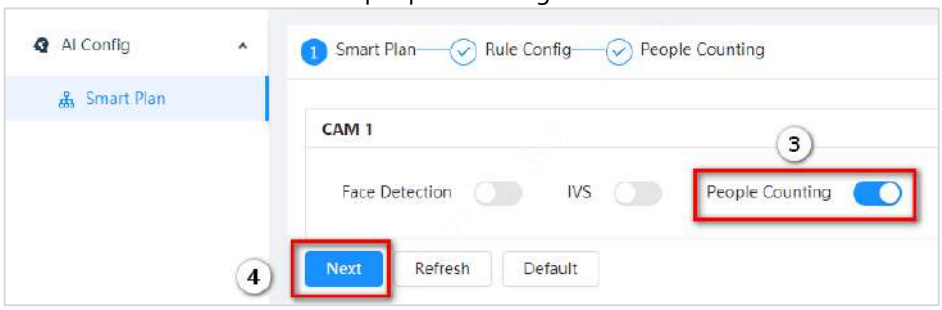
On the homepage, select **AI > AI Config > Smart Plan**.

Configure a smart plan.



Enable **People Counting**, and then select **Next**.

Enable people counting



Click **People Counting** tab.

Click **Add Rule**, and then select **People Counting** rule.

The added rules will be displayed in the list. Click the text box under **Name** to edit the rule name. The rule is enabled by default.

The camera supports adding multiple counting rules, and the counting results are displayed separately in different detection areas. It supports up to 4 people counting (tripwire) rules.

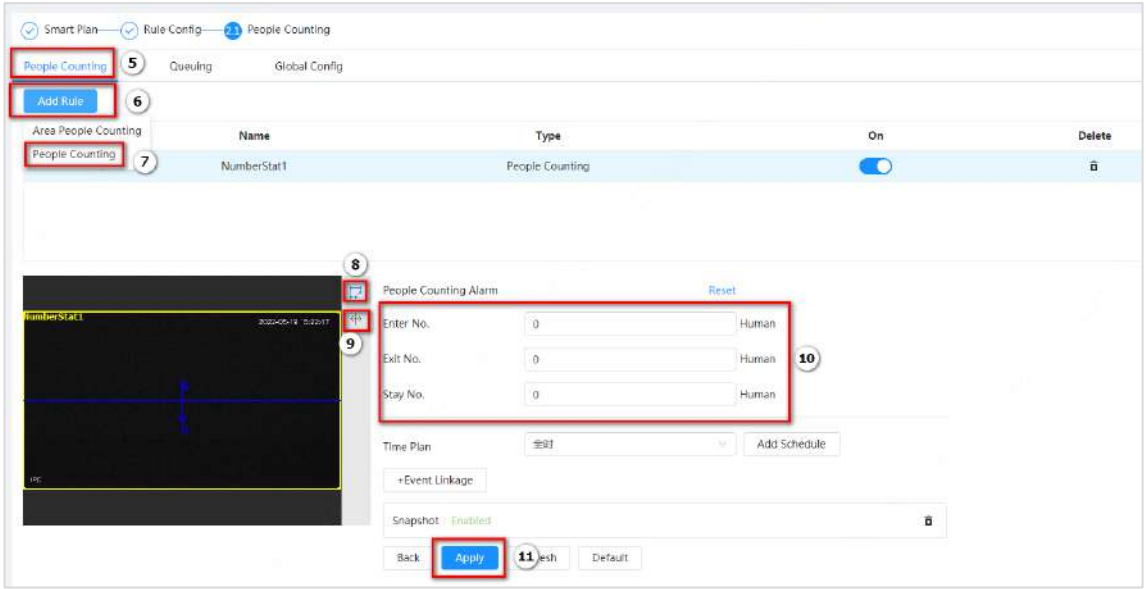
Draw a detection area.

Click , draw the detection area on the left monitoring image, and then right-click to complete the drawing.

Click to draw the direction line in the detection area.

When targets enter or leave the detection area along the direction line, they will be counted.

Configure people counting (tripwire)



Configure people counting (tripwire) parameters.

Description of people counting (tripwire) parameters

Rule	Parameter	Description
People counting (tripwire)	Enter No.	Counts the number of people entering in the direction A-->B. When the number exceeds the configured value, an alarm is triggered.
	Exit No.	Counts the number of people entering in the direction B-->A. When the number exceeds the configured value, an alarm is triggered.
	Stay No.	It is the difference between the Enter No. and Exit No. When the number exceeds the configured value, an alarm is triggered.
	Clear	Clear the counted number.

Configure the arming time plan and event linkage action.

If the added schedule does not meet the requirements, click **Add Schedule** to add a new arming schedule.

Click **+Event Linkage** to add linkage actions and configure linkage parameters.

Click **Apply**.

Result

The real-time results of people counting (tripwire) are displayed on the **Live** page.

The entry and exit numbers are displayed on the people counting detection box.

Area People Counting

The system counts the people in the detection area and the duration that people stay in the area. When the counted number of people in the detection area or the stay duration exceeds the configured value, an alarm is triggered, and the system performs an alarm linkage. This function is available on some select models.

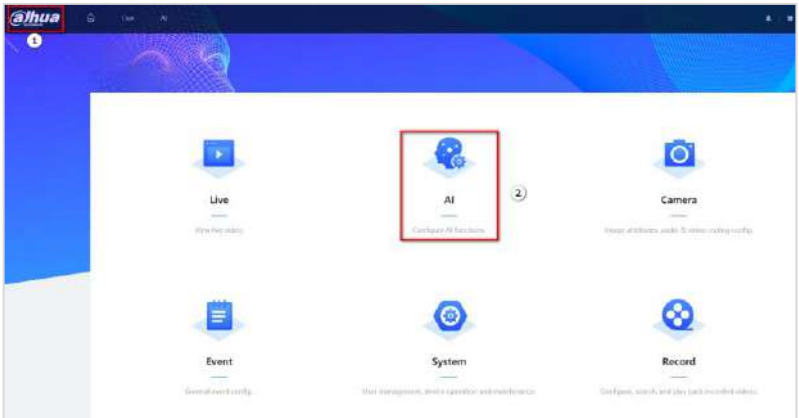
Prerequisite

The global configuration of IVS is completed. For details, see "o Global Configuration".

Procedures

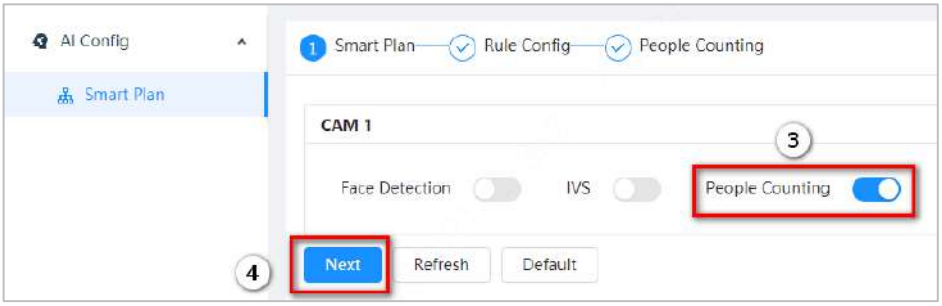
Step 1 On the homepage, select **AI > AI Config > Smart Plan**.

Configure a smart plan.



Enable **People Counting**, and then select **Next**.

Enable people counting



Click **People Counting** tab.

Click **Add Rule**, and then select **Area People Counting** rule.

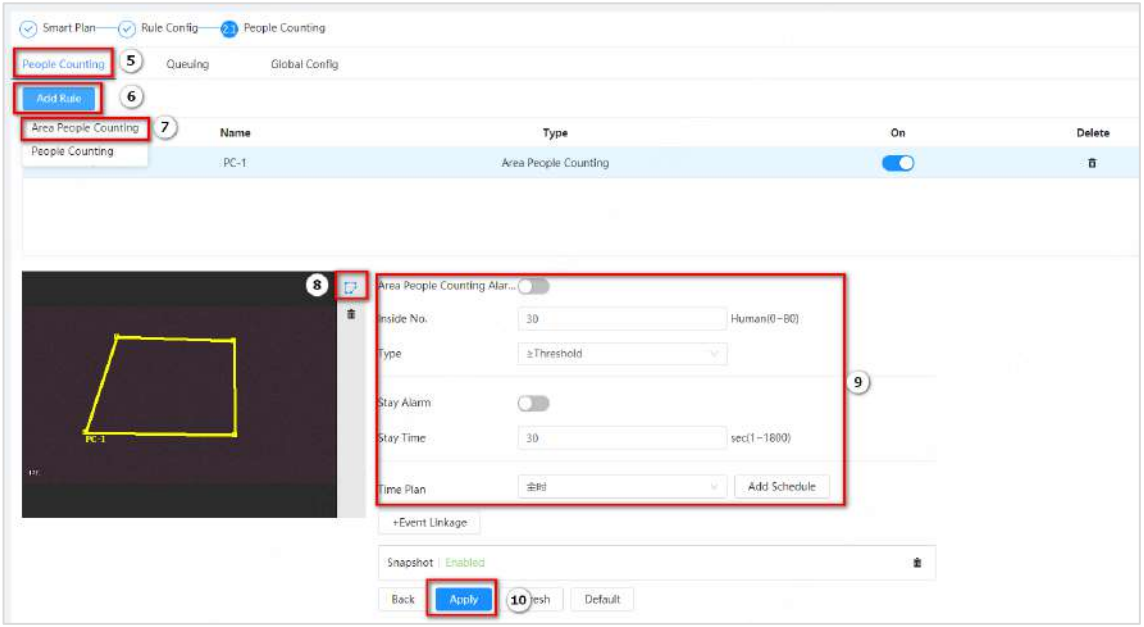
The added rules will be displayed in the list. Click the text box under **Name** to edit the rule name. The rule is enabled by default.

The camera supports adding multiple counting rules, and the counting results are displayed separately in different detection areas. It supports up to 4 area people counting rules.

Draw a detection area.

Click , draw the detection area on the left monitoring image, and then right-click to complete the drawing.

Configure area people counting



Configure parameters of area people counting.

Parameter description of area people counting

Rule	Parameter	Description
Area people counting	Area People Counting	Enable the area people counting function.
	Inside No	Configure the number of people in the people counting region. When the people count reaches the configured value, an alarm is triggered. When you configure inside number to 0, and select **≥ Threshold** in **Type**, the system will not perform the alarm linkage.
	Type	
	Stay Alarm	Enable **Stay Alarm**.

Rule	Parameter	Description
	Stay Time	When the stay duration exceeds the configured value, an alarm is triggered.

Configure the arming time plan and event linkage action.

If the added schedule does not meet the requirements, click **Add Schedule** to add a new arming schedule.

Click **+Event Linkage** to add linkage actions and configure linkage parameters.

Click **Apply**.

Result

The real-time results of people counting are displayed on the **Live** page.

The entry and exit numbers are displayed on the detection box of area people counting.

Queuing

The system counts the people queuing in the detection area. When the number of people queuing exceeds the configured number or the queuing time exceeds the configured time, an alarm is triggered, and the system performs an alarm linkage.

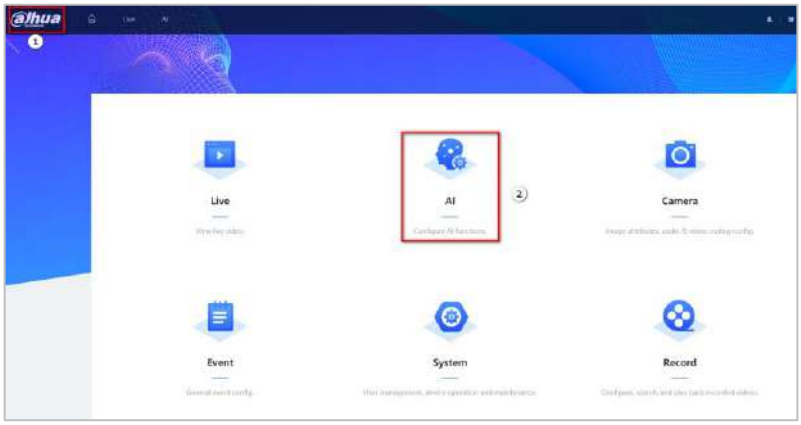
Prerequisite

The global configuration of IVS is completed. For details, see "o Global Configuration".

Procedures

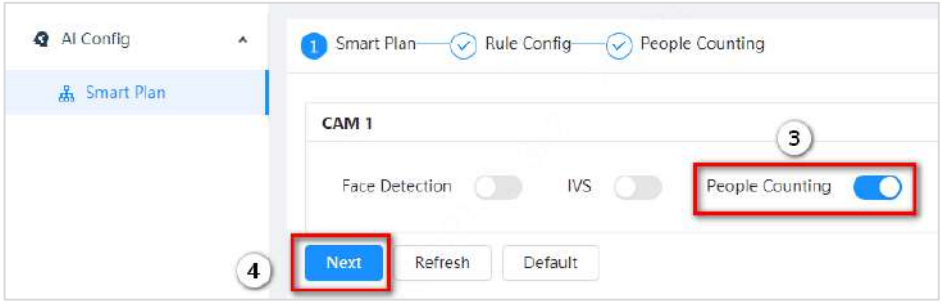
Step 1 On the homepage, select **AI > AI Config > Smart Plan**.

Configure a smart plan.



Enable **People Counting**, and then select **Next**.

Enable people counting



Click the Queuing tab.

Select **Add Rule > Queuing**.

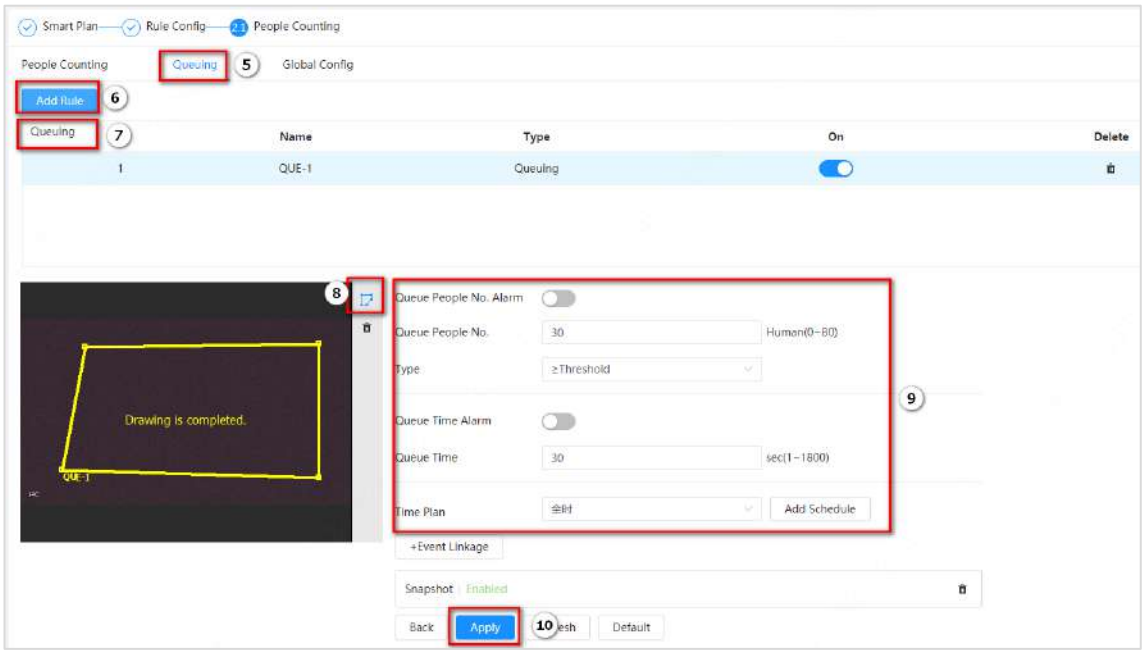
The added rules will be displayed in the list. Click the text box under **Name** to edit the rule name. The rule is enabled by default.

The camera supports adding multiple counting rules, and the counting results are displayed separately in different detection areas. It supports up to 4 queuing rules.

Draw a detection area.

Click , draw the detection area on the left monitoring image, and then right-click to complete the drawing.

Queuing



Configure queuing parameters.

Description of queuing parameters

Parameter	Description
Queue People No. Alarm	Enable the queue people No. alarm function.
Queue People No.	Configure the number of people queuing in the detection region. When the people count reaches the configured value, an alarm is triggered. When you configure the number of people queuing to 0, and select **≥ Threshold** in **Type**, the system will not perform the alarm linkage.
Type	
Queue Time Alarm	Enable the queue time alarm function.
Queue Time	Configure the queue time. When the queue time reaches the configured value, the alarm is triggered.
Time Plan	

Configure the arming time plan and event linkage action.

If the added schedule does not meet the requirements, click **Add Schedule** to add a new arming schedule.

Click **Event Linkage** to add linkage actions and configure linkage parameters.

Click **Apply**.

Result

You can view the queuing results on the **Live** page

Global Configuration

Configure the sensitivity of each people counting rule.

Procedures

Step 1 On the homepage, select **AI > AI Config > Smart Plan**.

Step 2 Enable **People Counting**, and then select **Next**.

Step 3 Click the **Global Config** tab.

Configure calibration.

Automatic calibration: click **Calibration Ground**, set the calibration area, click **OK**, and then the value calculated by the algorithm will be automatically entered in the corresponding columns.

Calibration ground: In the automatic calibration mode, the default calibration box is in the center of the image. We recommend you select the area with rich ground texture to improve the success rate and accuracy of automatic calibration.

Clear: In the automatic calibration mode, after calibrating ground, click **Clear** to clear the calibration box, and then you can select the calibration area again.

Manual calibration: After measuring the installation height and angle of the camera on the spot, drag the slider or enter measured value in the the installation height and angle columns, and then click **OK**.

Step 4 Configure the sensitivity.

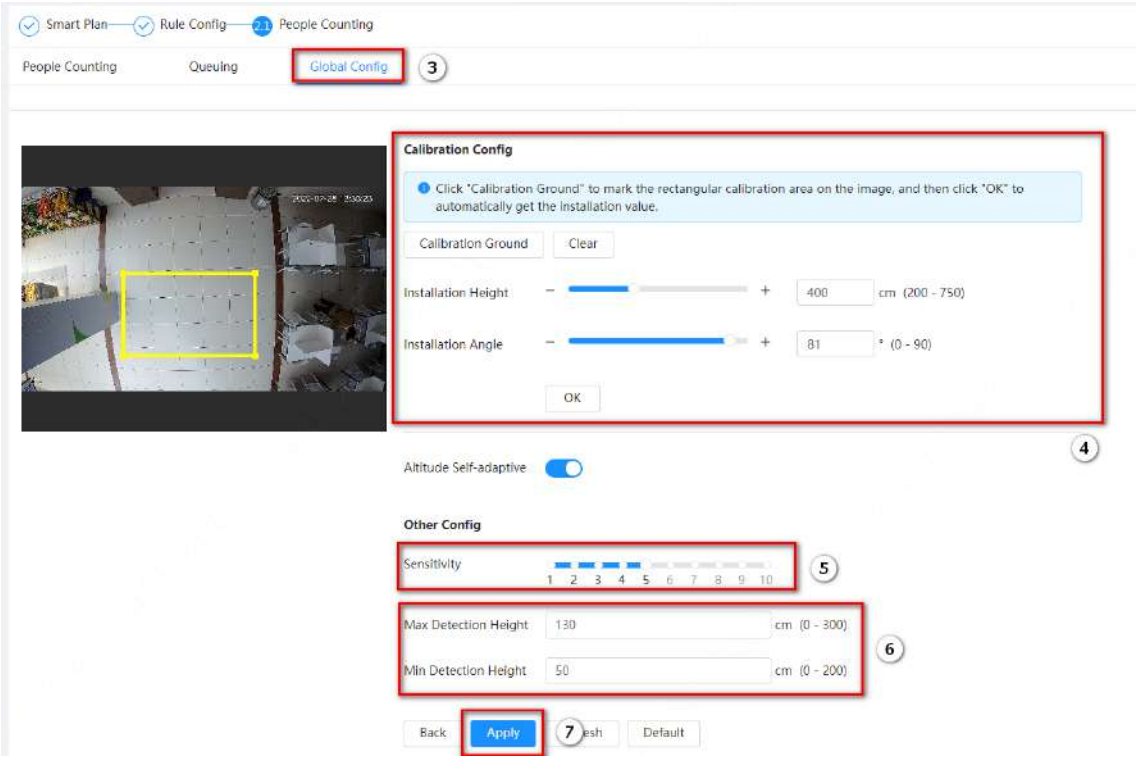
The higher the sensitivity, the easier the detection, but the more the false detections.

Configure the maximum and minimum detection heights.

If the target height exceeds the predefined maximum detection height, the algorithm will filter the target.

If the target height is lower than the predefined minimum detection height, the algorithm will filter the target.

Global configuration (people counting)



Click **Apply**.

People Counting Report

Search for the counting results with different rules and counting methods.

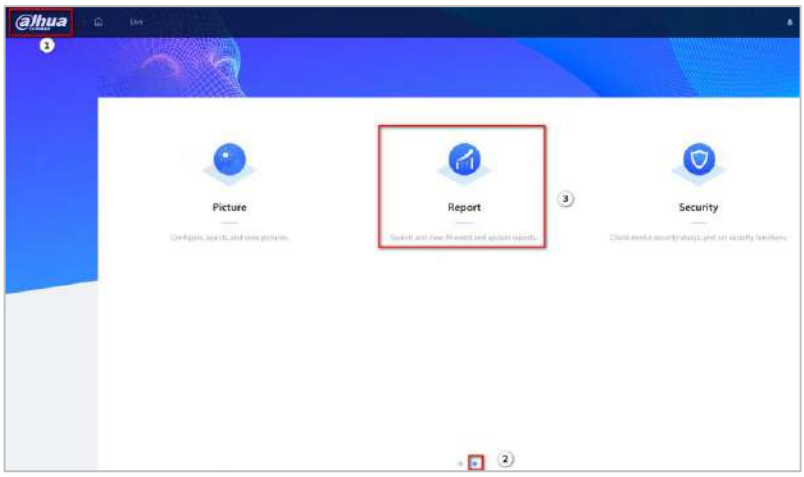
Prerequisite

Make sure that you have configured the rule before searching for the report.

Procedures

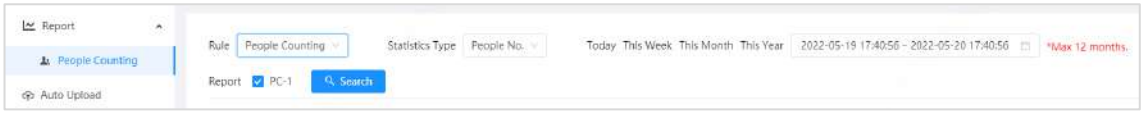
Step 1 On the homepage, select **Report > Report > People Counting**.

Configure a smart plan



Configure search conditions.

Configure search conditions for people counting (tripwire)



Configure search conditions for area people counting

Configure search conditions for queuing

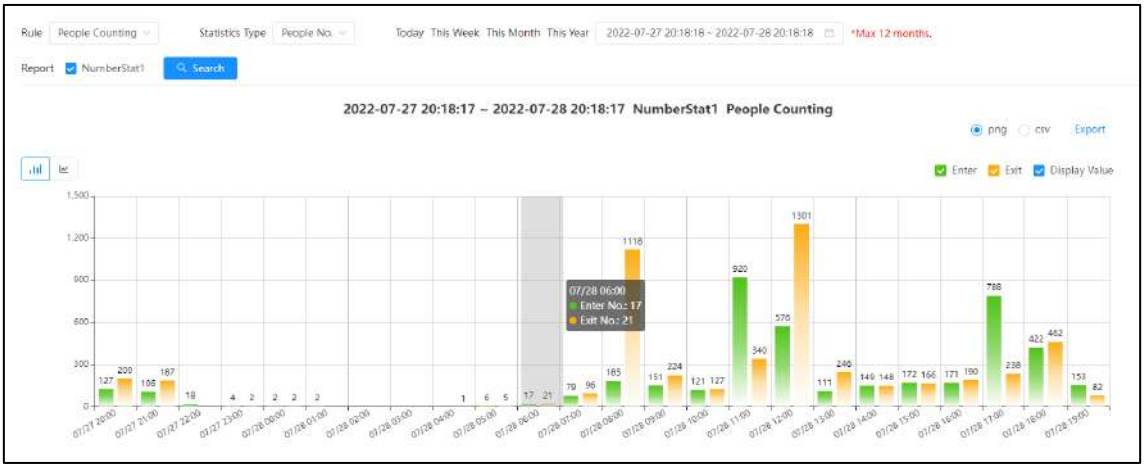
Configure search conditions

Parameter	Description
Rule	Select the rule as needed, and then you need to select the statistics type according to the select rule.
Statistics Type	The statistics type of the people counting report. People No.: Displays the report of the number of people that meet the configured condition. Strand Time: Displays the report of the average stranding time in the detection area during a certain period. It is available when the rule of **Area People Counting** is selected.
Stay Time	When selecting rule as **Area People Counting,** and statistics type as **People No.**, you need to configure this parameter. The report displays the number of people whose stay time is shorter than the stay time threshold and is equal to or longer than the stay time threshold.

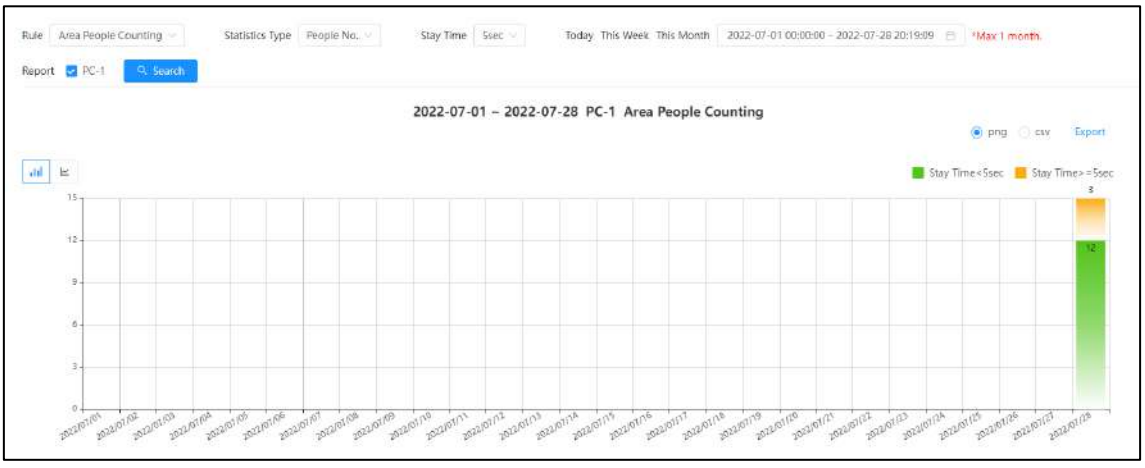
Parameter	Description
Queue Time	When selecting rule as **Area People Counting**, and statistics type as **People No.**, you need to configure this parameter. The report displays the number of people whose stay time is shorter than **Queuing Time** and is equal or longer than **Queuing Time**.
Period for the report	Set the period for the report. When selecting rule as **People Counting**, you can view the daily, weekly, monthly and yearly reports, and you can also customize the period. When selecting rule as **Area People Counting** or **Queuing**, you can view the daily, weekly, and monthly reports, and you can also customize the period.
Report	Select the rule name of the report that you want to search for. You can select multiple rule names at the same time.

Click **Search**.

People counting (tripwire)

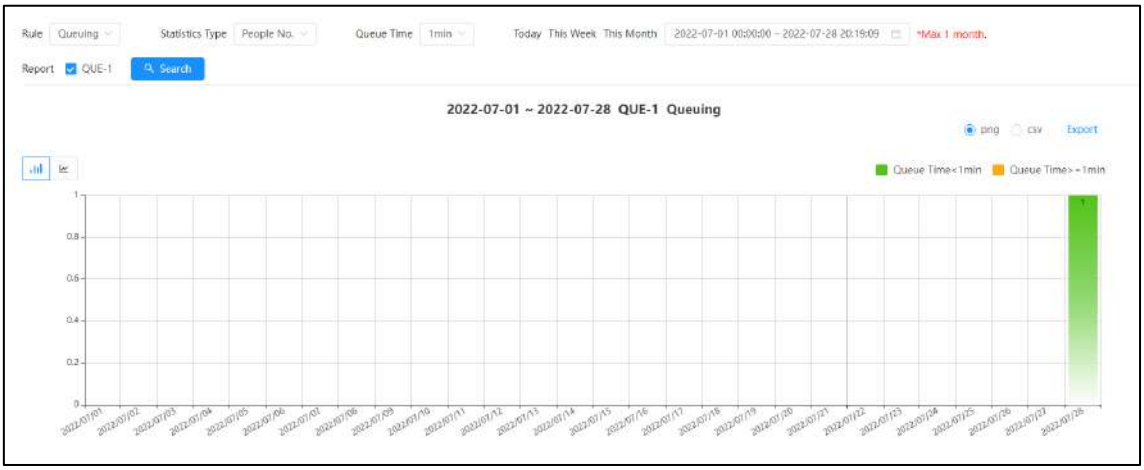


Area people counting (number of people)



Area people counting (stay time)

Queuing



Related Operations

Select the report form

Click to display the report in line chart; click to display the report in bar chart.

Select the statistics type on the upper-right corner

The statistics result of unselected types will not be displayed.

Export reports

Select the file format, and then click **Export**.

Select png: Displays the report in picture format.

Select csv: Displays the report in list format.

FAQ

No Alarm is Triggered When Detecting an Alarm Event

Problem

After drawing the rules, the camera does not perform detection when a person enters or exits the detection area.

Possible Reasons

The function is not enabled.
The controls are not working properly.
The program is not up-to-date.
The algorithm is invalid.
The installation is inappropriate.
Device errors.
The test is inappropriate.

Solutions

Step 1 Make sure that the scenarios conform to the installation standard, without backlight and occlusion, and the pixels of targets meet the detection requirements.

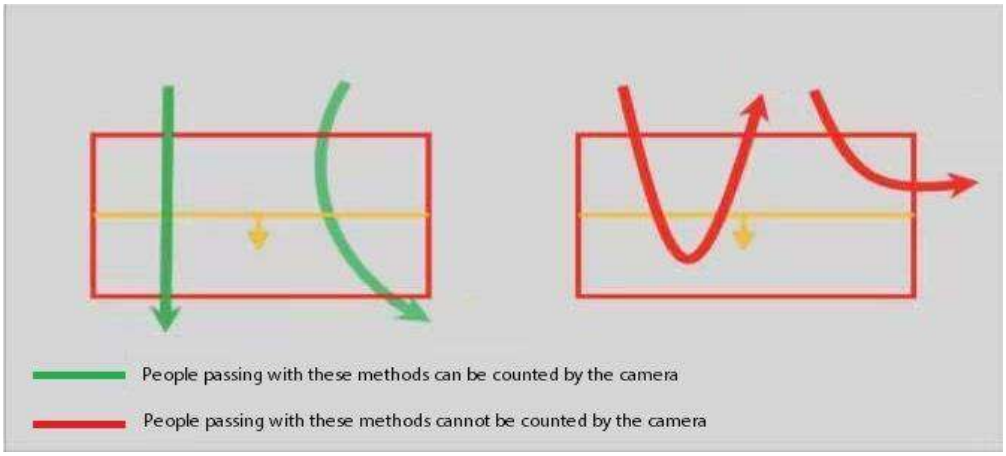
Make sure that the smart rule of people counting is enabled.

Delete the controls and clear the browser cache.

Check whether the program is the latest baseline version, and whether the algorithm is invalid.

Check whether the test method meets the standard.

Enable the smart function



If none of the above operations can solve the problem, contact the after-sales services for repair.

The Camera Automatically Restores to Default Settings

Problem

The camera automatically restores to default settings after a period of normal use.

Possible Reasons

Manual operation (in most cases).
Device errors.

Solutions

Step 1 Make sure that the program is the latest baseline version.

Step 2 Check the stored videos, find the expiration period, and then export the logs.

Step 3 Find the configuration logs saved in the corresponding period and record the corresponding IP address.

Step 4 Search for the identity of the IP address. The user of this IP address changes the configuration and restores the device to default settings.

Step 5 Configure the allowlist and change the password.

Step 6 If none of the above operations can locate or solve the problem, submit ITR or contact after-sales services for repair.

ENABLING A SAFER SOCIETY AND SMARTER LIVING

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