HIKAUTO

HIKVISION

360AVM Calibration Guide

Contents

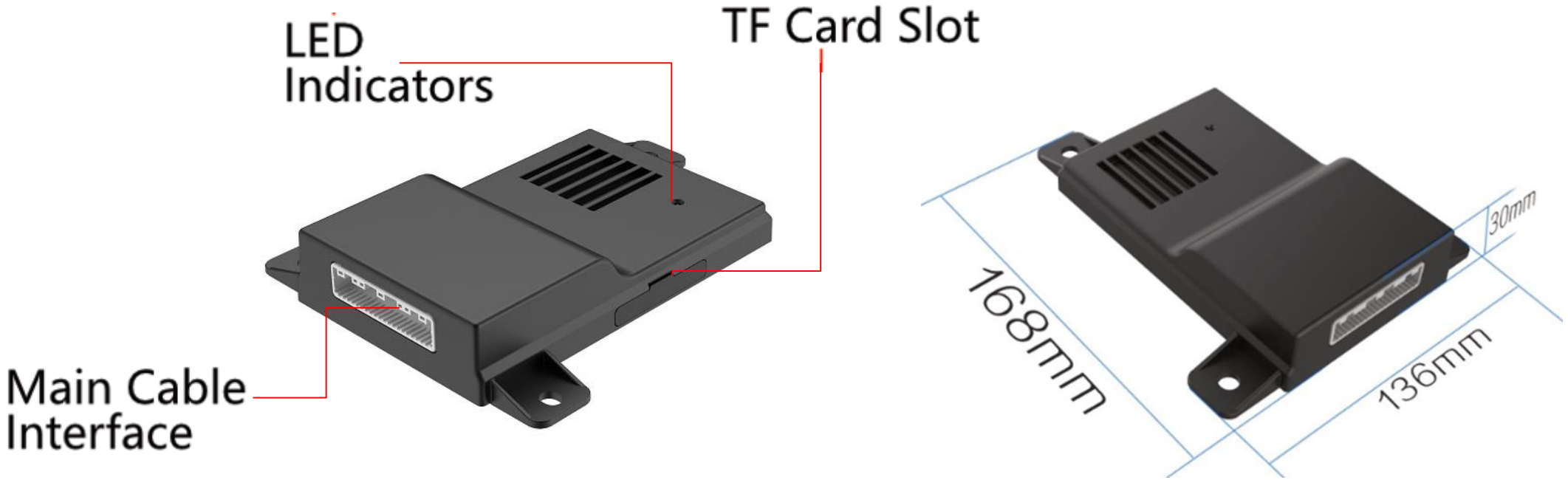
Product Introduction

360 Around View Monitor

host	camera	harnesses	screen
			
AE-VE242A-A	AE-VA236A	AE-MCE21X	AE-MW1110

Please contact the MKT colleagues in the corresponding region for specific product models

Product Introduction



LED Indicator Status:

Red and green flashing alternately- device is starting.

The red light flashes- Camera disconnected or camera error.

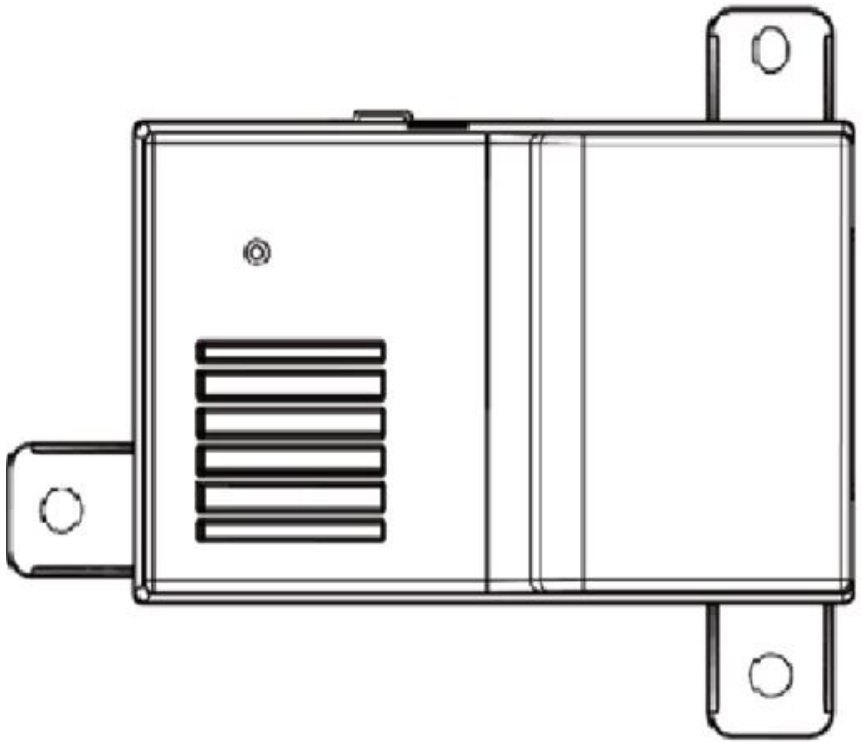
The red light flashes slowly- TF card not inserted, or TF card error.

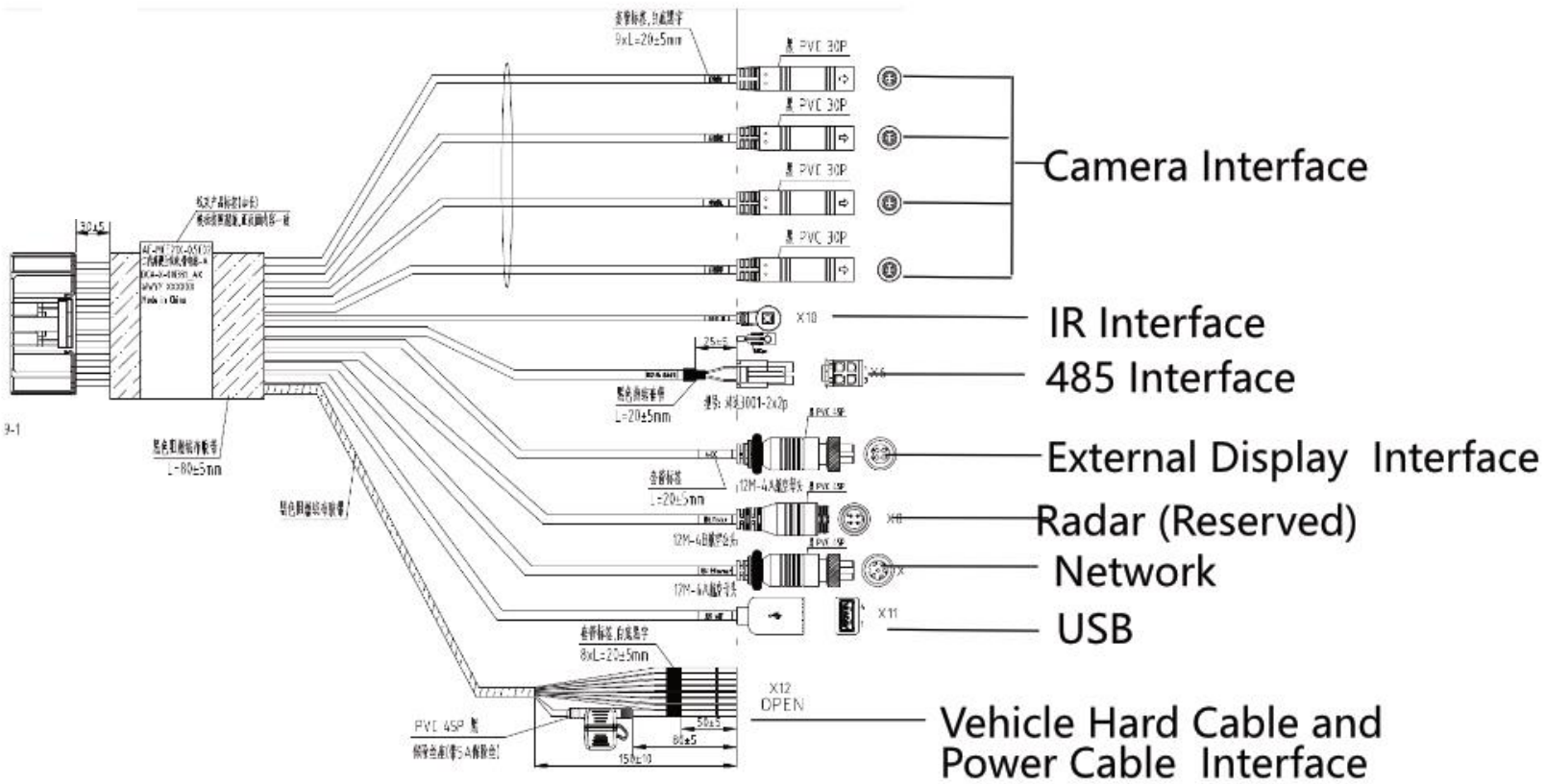
The red light is always on- Upgrading, green light flashing when finished.

The green light is flashing- Device working normally.

Product Introduction

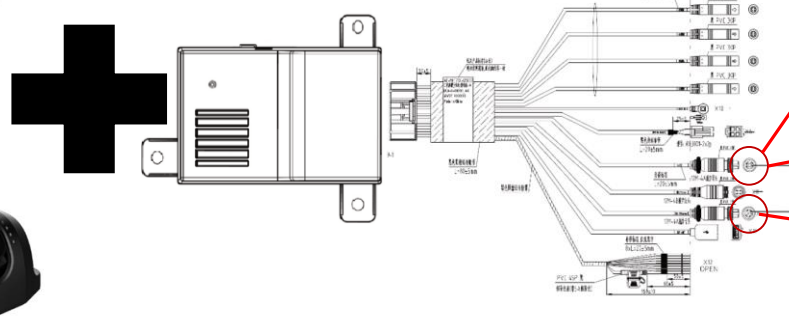
External Interfaces





Product Introduction

4 channel camera



Method 1

360AVM external display screen

Method 2

360AVM external mobile DVR

Internet platform

Mobile DVR external display screen

Method 3

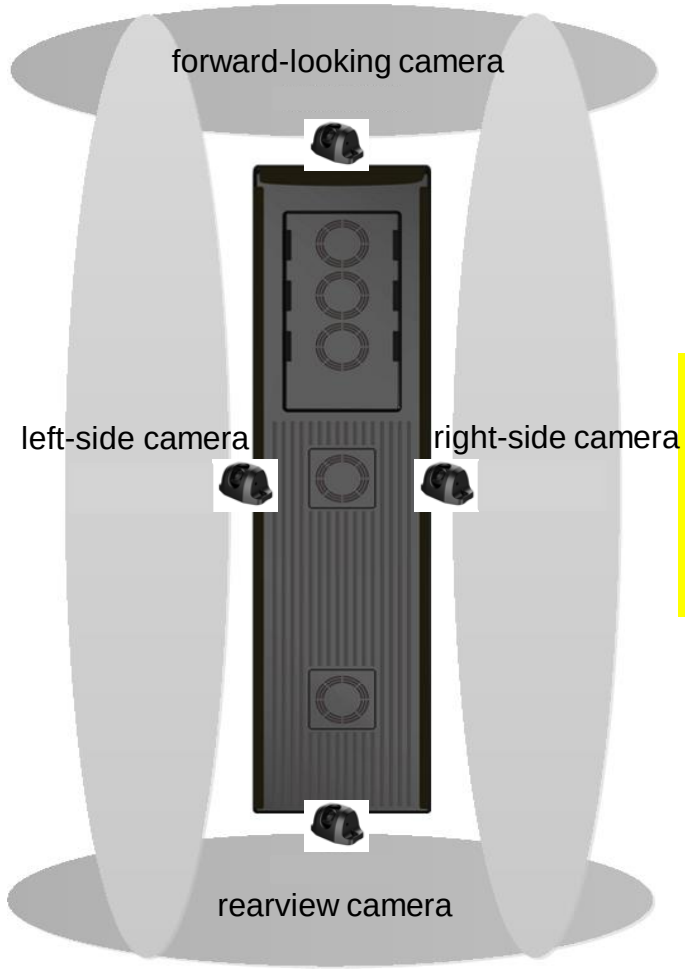
360AVM external mobile NVR

Mobile NVR external display screen

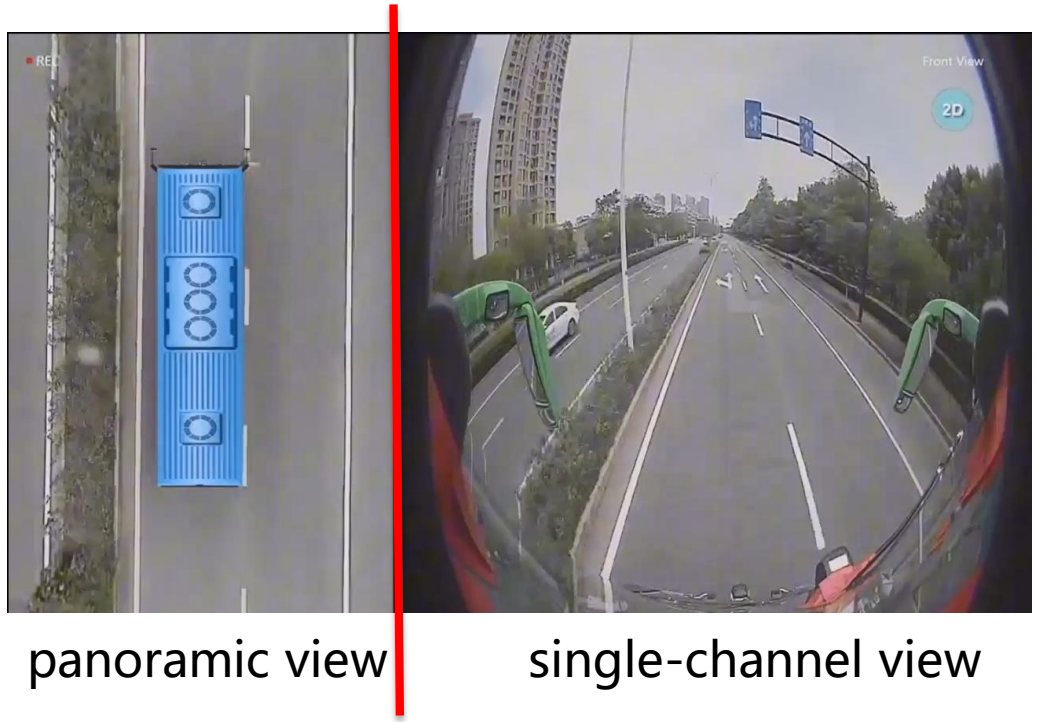
Note: The wiring harness for different programmes is different. Please contact the MKT in the corresponding area to obtain the material number for the corresponding scheme

Product Introduction

- Effective display



Screen display picture



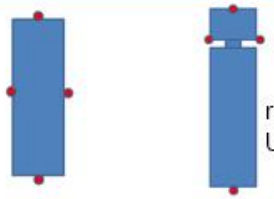
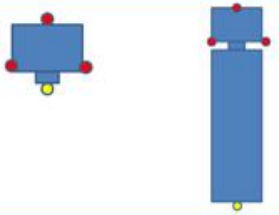
panoramic view

single-channel view

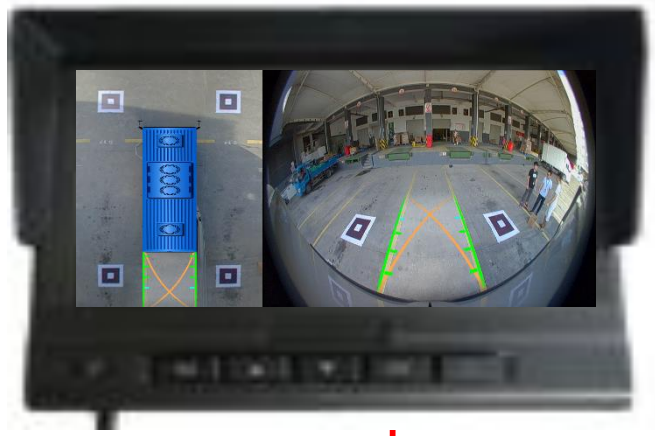
Contents

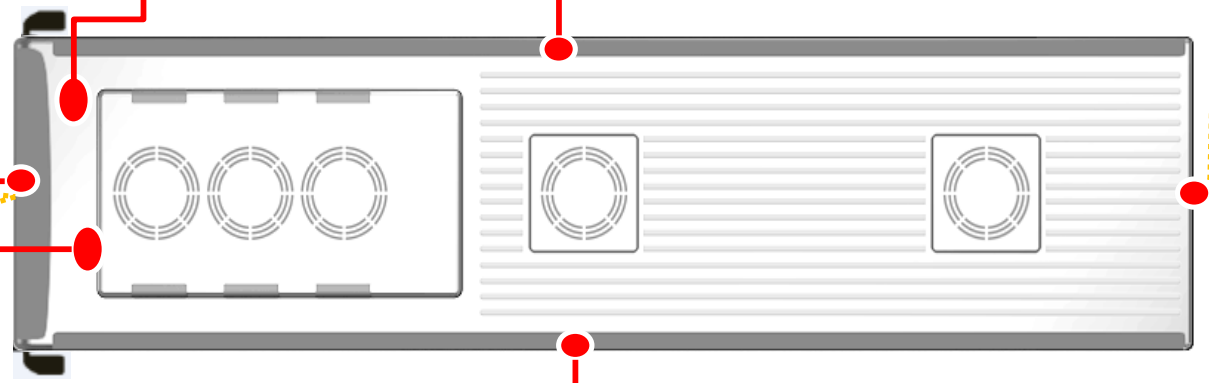
Device Installation

Installation Position for Different Types of Vehicles

4-Channel Stich	3-Channel Stich
 rear cam should not be installed Under the dump box	 rear cam should be installed Under the dump box
Suitable for all-in-one vehicles less than 13 m: bus, coach, School bus, sanitation car, concrete car.	Suitable for front the heavy truck, muck car
1.4 fish-eye cameras for 360° stich 2. Left and right cameras can be installed either on the side of vehicle head or body	1.3 cameras(red) stich+1 rear camera (yellow) for 270°+rear view 2. All 3 cameras are installed on the vehicle front rather than body.
 	 
 	

Device Installation: Passenger vehicles





Device Installation: Truck

- Choose a smooth surface for installation
- Avoid protruding objects that blocks the camera view
  - If the backing camera is already installed at the top place of the vehicle rear, then install the around rear view camera under the backing camera
- Make sure that the 4 cameras are of the similar height.

Device Installation

- Camera Installation
  - Choose a smooth surface for installation
  - Avoid protruding things to block the camera view
    - If the backing camera is already installed at the top place of the vehicle rear, then install the around rear view camera under the backing camera

Front view camera at the top middle of the vehicle front

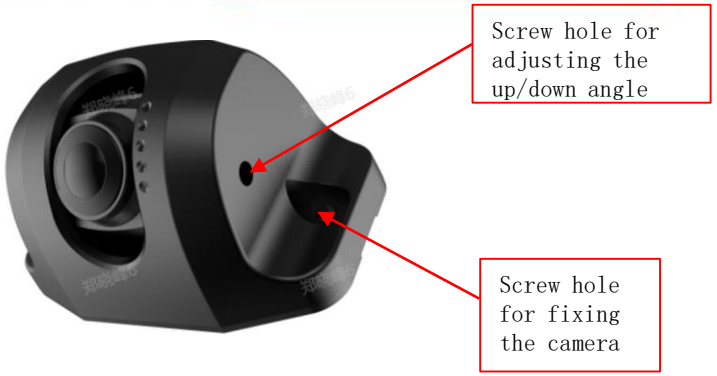
Left/Right view camera at the top middle of the vehicle middle

Rear view camera at the top middle of the vehicle rear

- Camera Wiring
  - Connect the female end of the extending cable with the camera
    - For the bus, wire the extending cable on the top of the vehicle, usually inside the hidden box.
    - Ask the professional electrician for help.

Device Installation

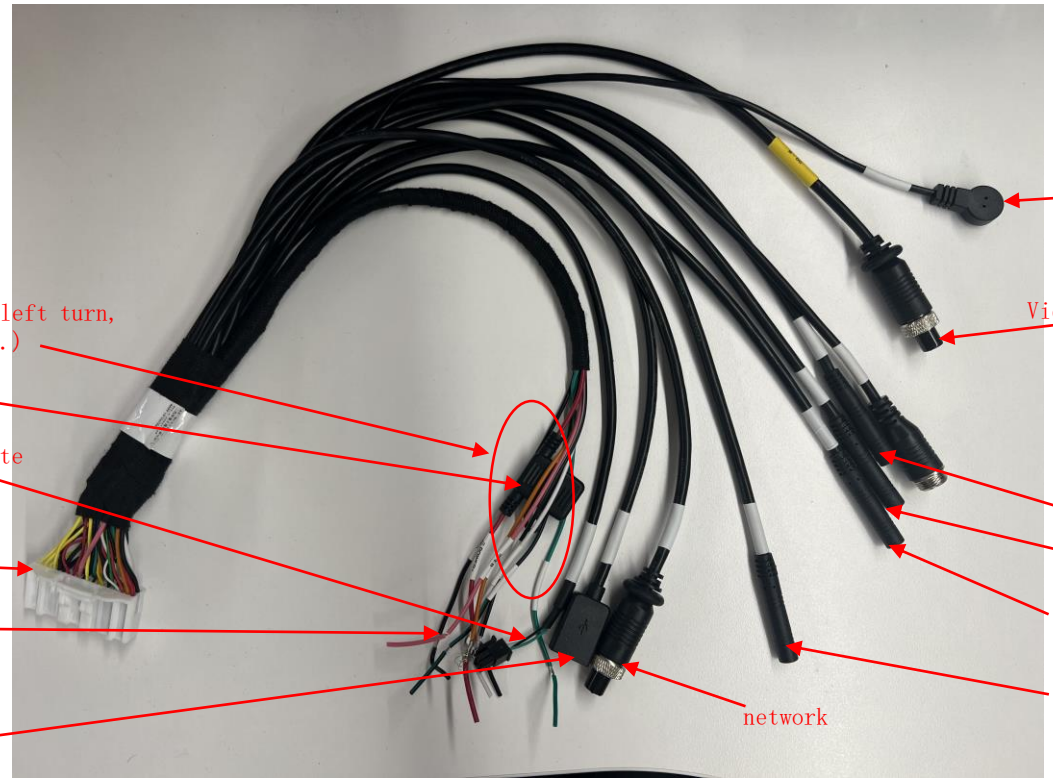
- Camera Fixation
  - For each camera:
    - Drill 2 screw holes, must be parallel to each other to avoid preview angle inaccuracy
    - Drill 1 cable holes for the camera cable wiring
      - Use tapping screw to fix the camera bracket on the vehicle body
      - Use the camera extending cable to wire the cable through the cable hole.
      - Apply water proof glues for all the holes



- Camera Angle Adjustment
  - When adjusting the camera angle, make sure that the bottom of the preview image covers up to 10% of the vehicle body to avoid blind spot.
  - Make sure that the images are complementary on the left and right.

Device Installation: Around View Host(VE242A) connect

- Choose a suitable position (the weak box recommended) in the front area of the vehicle body to place the host(VE242A).
- The 4 extension lines are respectively connected with the 4 camera connection lines on the cable of the around view host (the harness of the around view host is marked with the connection marks of the front, rear, left and right cameras).
- The video output line can be connected to the display screen or the MDVR, and the power line is connected to the vehicle body power supply.
- The signal wires of the vehicle body are respectively connected to the signal terminals of the vehicle body.



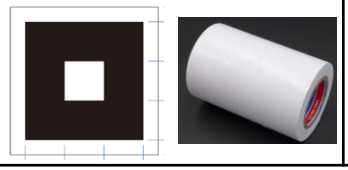
Power Cable Description	Color	Vehicle Cable
Power	Red	Stable electricity
Ground	Black	Ground
ACC	Yellow	ACC

Installation Preparation

- Tools for installation:
  - The installation of equipment may require the use of the following tools during installation

Screw driver	Electric drill	Electrical tape	Tape measure	etc
				

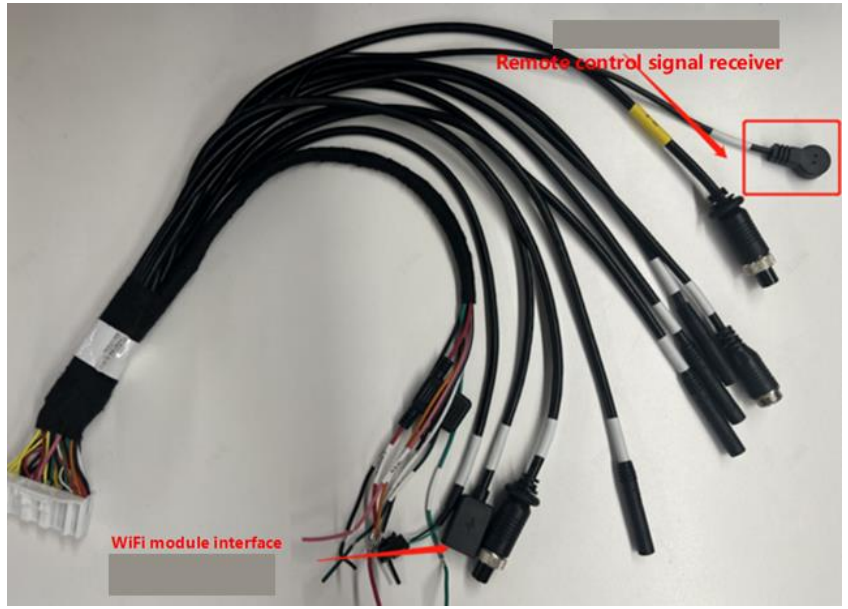
- Tools for calibration:

Remote controller	Wi-Fi module	TF cards	Card reader	Calibration cloth	etc
					

  - Type of calibration cloth
    - 1. Static vehicle line：
      - (1)Simulate using PVC white tape
      - (2)Painting and scribing can be used.
    - 2. Homocentric Square Calibration
      - Print calibrated cloth at a print store upon request or use black and white tape to stick it on the ground to achieve

Operating mode

Remote control calibration and APP calibration



- Remote Control Calibration

Use the accompanying remote control and aim at the signal receiver of the 360AVM.

- APP calibration

Insert the accompanying Wi-Fi calibration, open Wi-Fi on the cellphone and connect to the hotspot of “HIKAUTO-360****”.

Insert the Hikvision’s Wi-Fi module into the cable interface so that APP can connect the device to be calibrated.

APP Icon

Android
(360 Assistant)

IOS
(HAT 360)

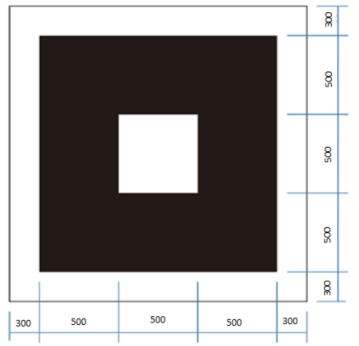
IOS can directly search for 'HAT 360' on the App Store

Scan to Download APP

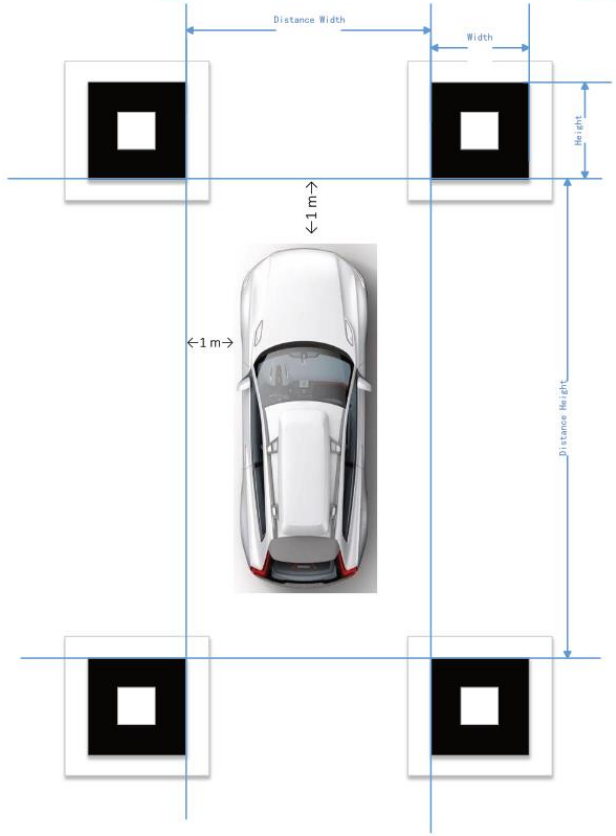
Calibration Method 1: Manual Calibration(Homocentric Square Calibration)

- Calibration cloth preparation
  - Requirements for calibration cloth: as shown on the right (standard square)； A black square with a side length of **1.5M.**
- **Site requirements:** leveling.
- **Camera installation position:** the highest vertical center line on all sides of the vehicle body.
- **Camera installation angle:** the lower edge of the field of view is tangent to the vehicle body ,symmetry left and right.
- Cameras should be installed at the similar height as possible to achieve the best stitching effect. (Self-assessment can be made according to the vehicle type)
- The camera is firmly installed to ensure that it will not be loose after use.
- Layout of calibration cloth site: as shown in the figure.

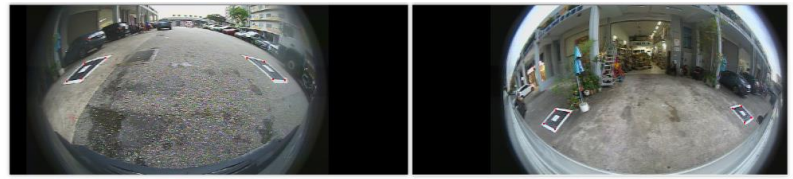
Requirements: **4 cameras can see the calibration cloth normally.** The calibration cloth is parallel and symmetrical up and down, left and right, and the center of the vehicle coincides with the center of the calibration cloth.



Material: non-woven fabrics
Length of the whole cloth: 2.1
Black side: 1.5 m
Unit in the figure: mm



- Data measurement:
  1. Body parameters.
  2. Camera height.
  3. Site parameters.
  4. Calibrate cloth parameters.
  5. Generate calibration results.



Advantages: The most accurate calibration results

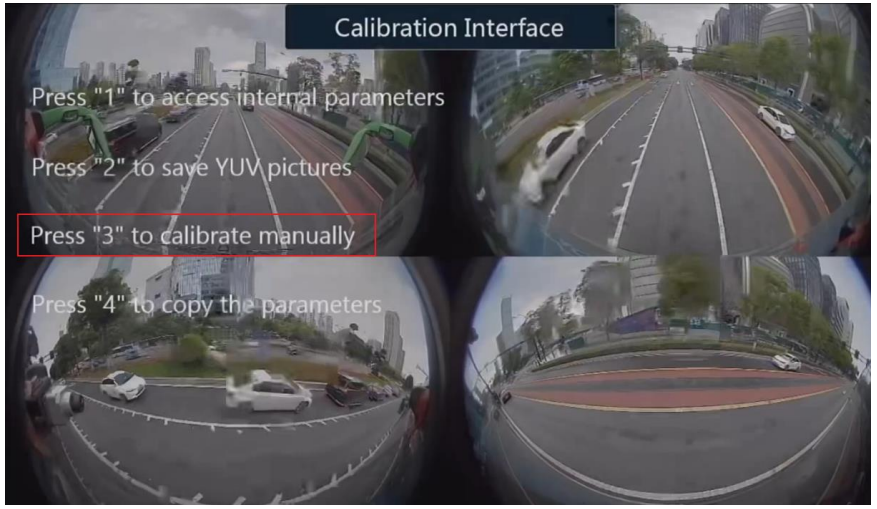
Calibration Method 1: Manual Calibration-Remote Control Calibration

Enter calibration mode

1.Press the "MENU" button of the remote control,

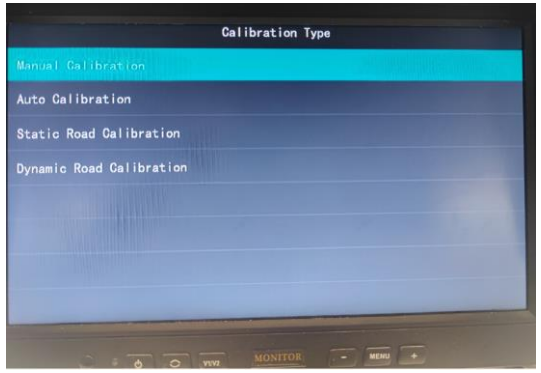
2.Click the number "6" six times,

3.Press the number "3" to enter the calibration mode selection.



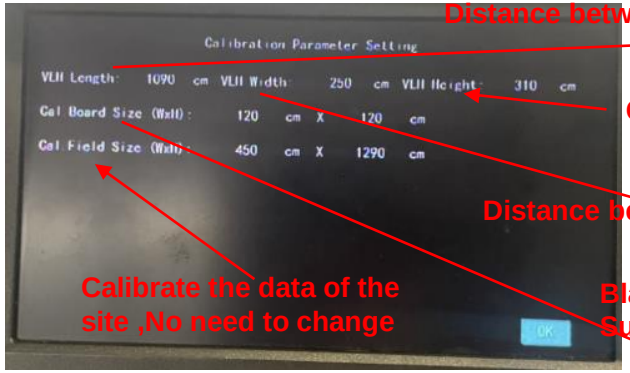
Calibration Method 1: Manual Calibration-Remote Control Calibration

- Manual calibration is a solution that involves setting up four calibration cloths in the field and then performing calibration.
- To select manual calibration, a calibration cloth with a black edge of 1.5M x 1.5M needs to be used. The distance between the vehicle body and the white edge of the calibration cloth is 100cm. After confirming that the calibration cloth is placed correctly, manual calibration can begin.

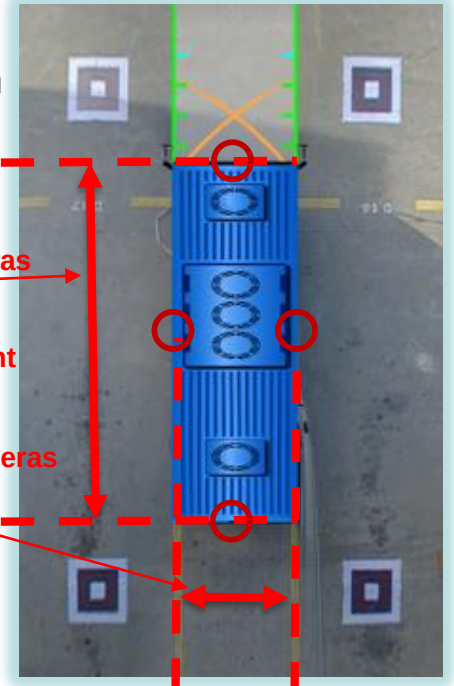


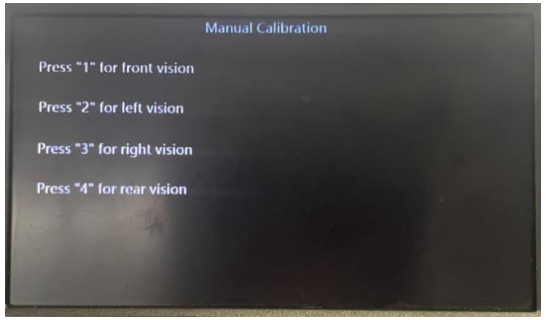
①Select **Manual Calibration** and click confirm ▶

②Select **4 channels** and click the confirm button ▶

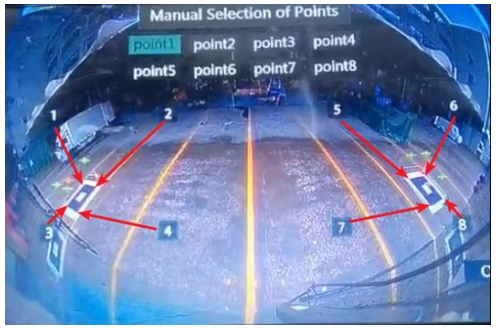


③Control the cursor movement through the directional keys ◀◀ ▶▶, enter the vehicle data, and then select OK option and confirm ▶ (Eliminate data with button Ⓒ)



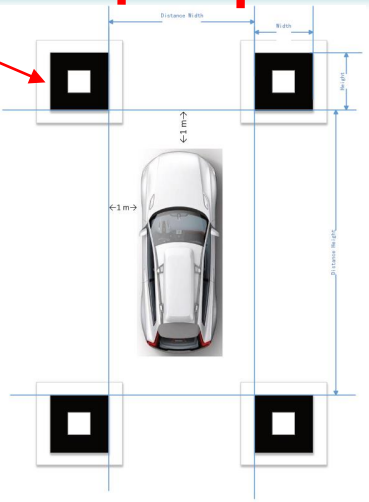


④Press the number keys to enter the configuration interface from different perspectives



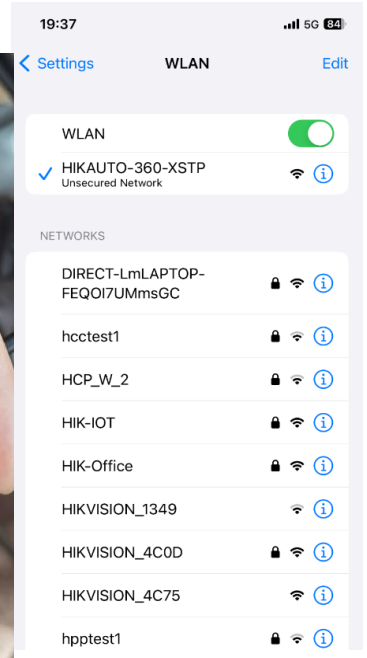
⑤According to the diagram, use the directional keys to move each point to the black edge vertex of the calibration clothUse the 1-8 number keys to select different points. After marking the 8 points, click the 9 key on the remote control to select the OK option, and then click the confirm button

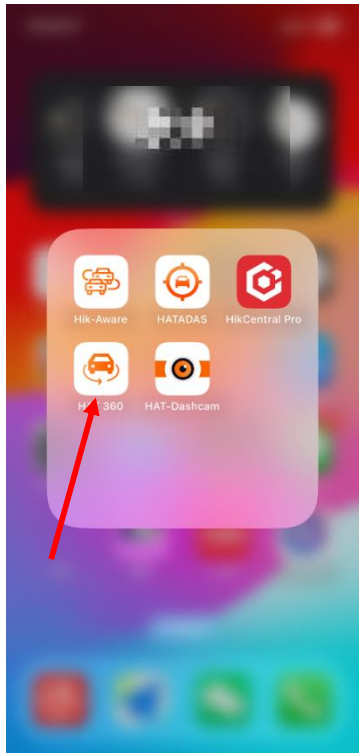
⑥Repeat steps ④ and ⑤ until all four perspectives have been marked; After configuring the fourth perspective and clicking the OK button, the device will automatically start calibration. Wait a few minutes for calibration to complete

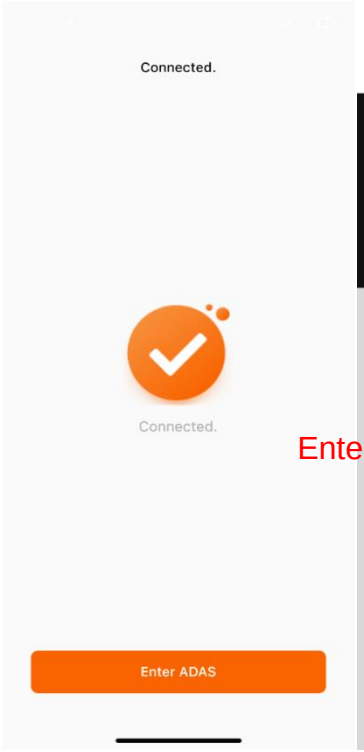


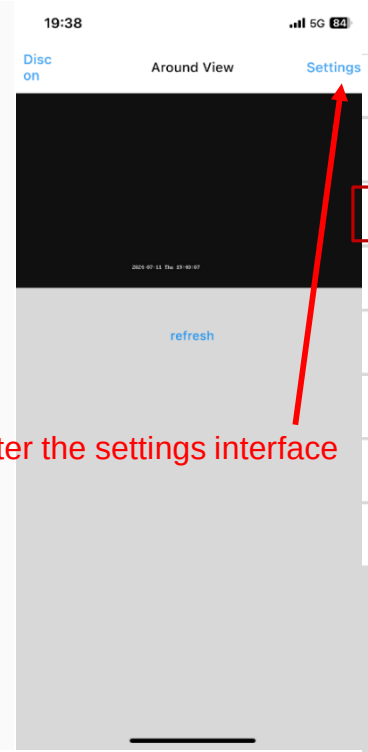
Calibration Method 1: Manual Calibration-APP Calibration

Insert the Wi-Fi module into the USB interface, find the wifi name starting with HIKAUTO-360*** and connect without entering a password.

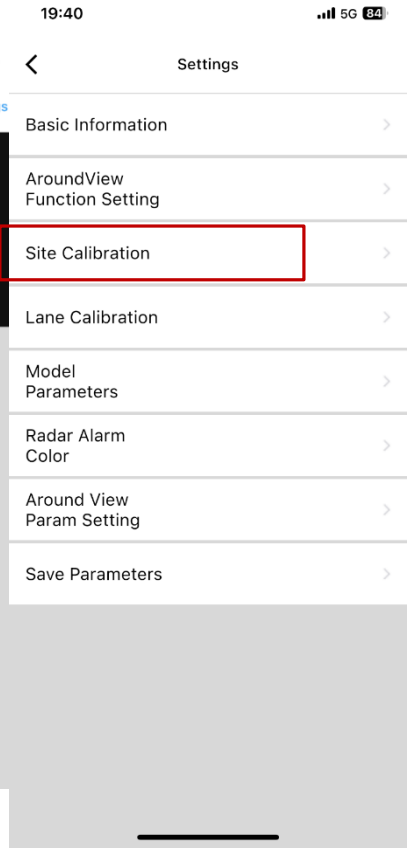




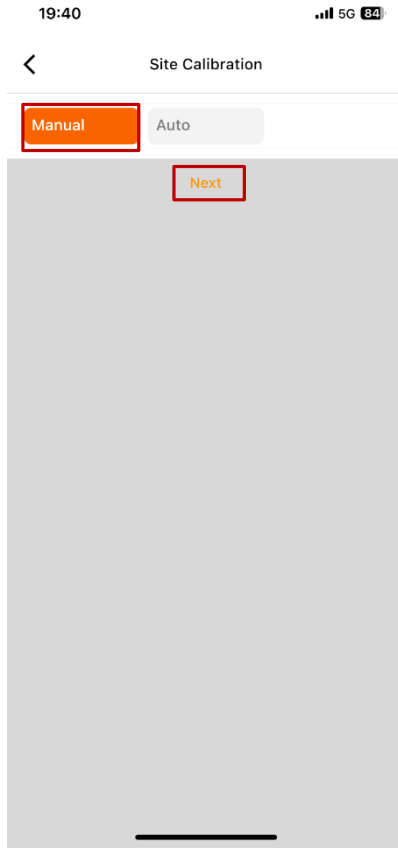




Enter the settings interface

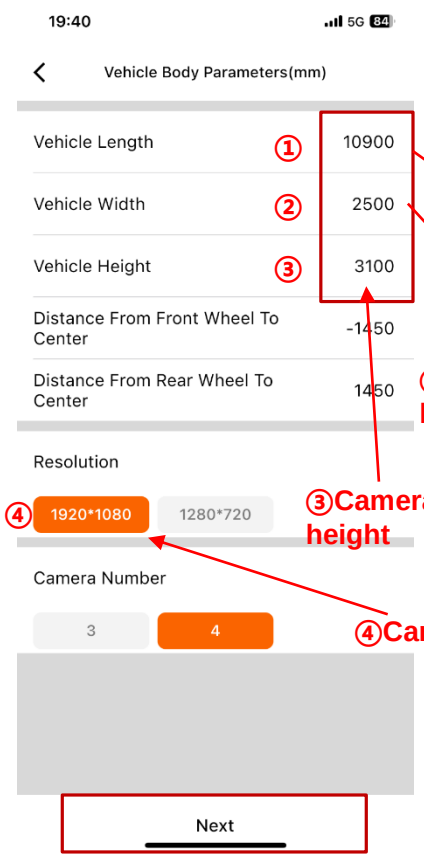


①Select **Site Calibration**



②After selecting **Manual**, click **Next** to proceed to the next step

Calibration Method 1: Manual Calibration-APP Calibration

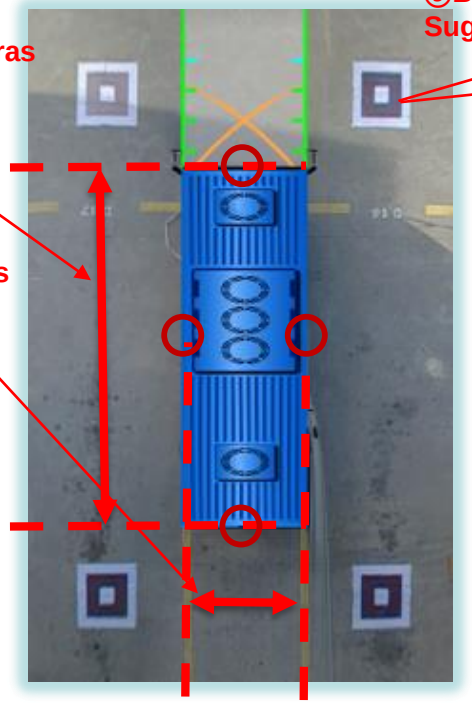


①Distance between front and rear cameras

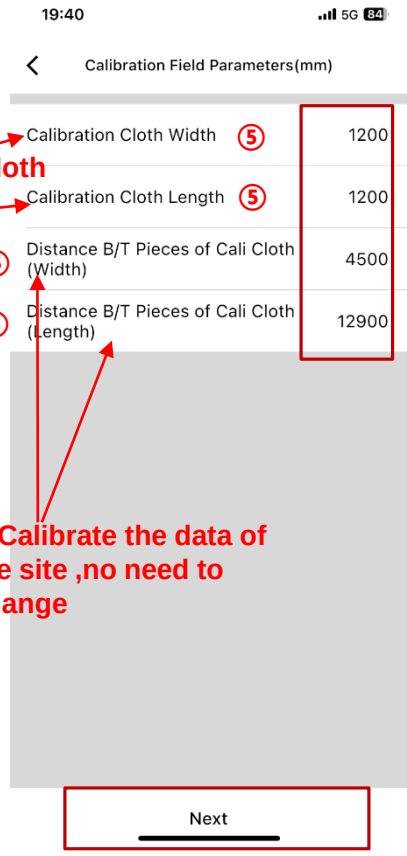
②Distance between left and right cameras

③Camera installation height

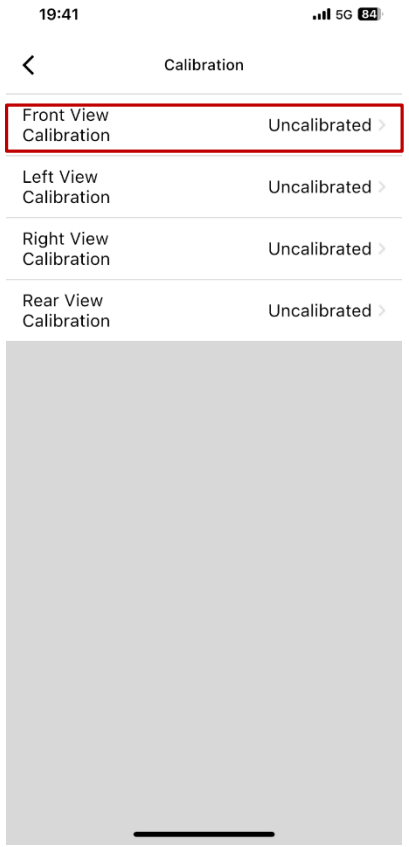
④Camera resolution



⑤Black edge length
Suggest using a 1.5M cloth



⑥Calibrate the data of the site ,no need to change

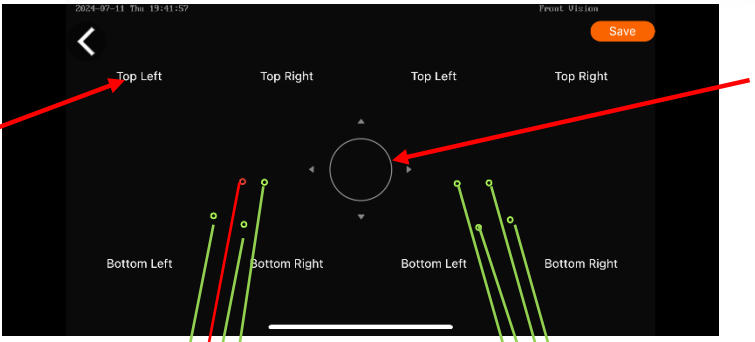


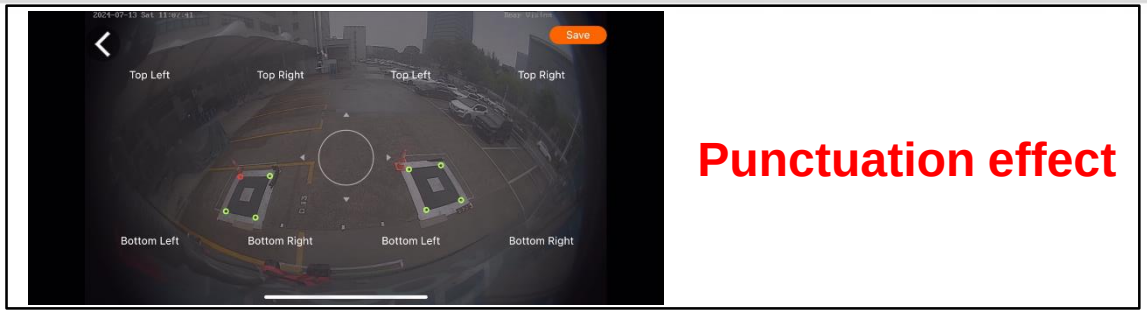
③Enter the vehicle parameters and click **Next** to proceed to the next step

④Enter the relevant parameters of the calibration cloth and click **Next** to proceed to the next step

⑤Click on any item to enter the calibration page for the corresponding perspective

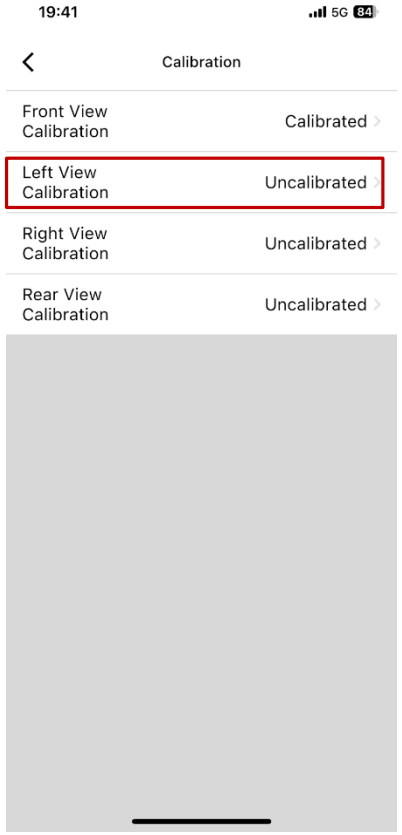
Calibration Method 1: Manual Calibration-APP Calibration



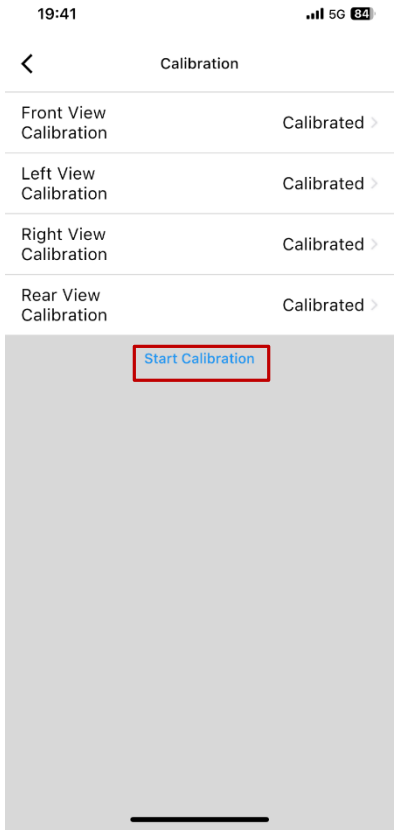


Punctuation effect

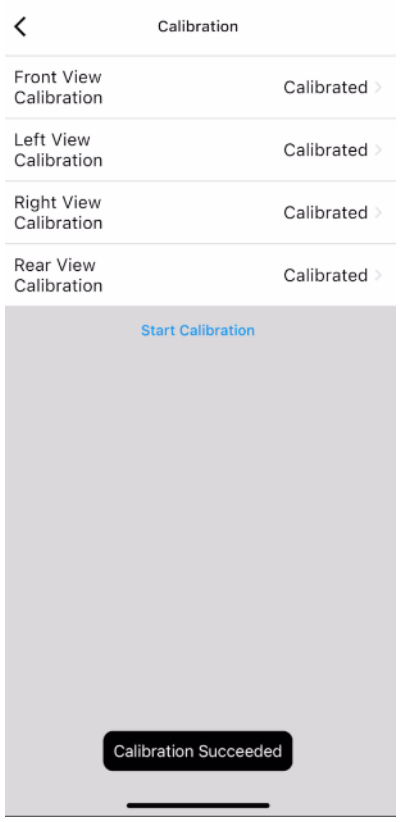
⑥Click on the **Top Left** option to calibrate the red point in the upper left corner;
Click the directional keys in the center of the screen to move the red dot;
The corresponding relationship between punctuation marks is shown in the figure;
After completing the calibration for all 8 points, click the **Save** button.



⑦The calibrated perspective will be marked as **Calibrated**, continue to select the next perspective for calibration



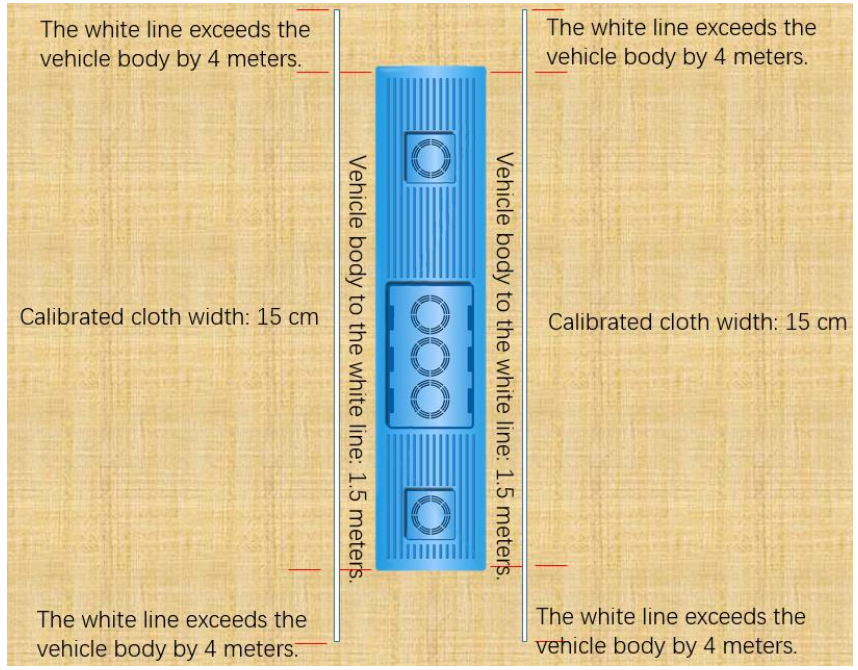
⑧Until all perspectives are marked as Calibrated, click on **Start Calibration** and it will take a few minutes for calibration to be successful



Calibration Method 2: Static Road calibration

- Calibration cloth preparation
  - **Requirements for calibration cloth:** as shown in the figure on the right
  - The criteria are as follows: Width 15 cm
- **Site requirements:** leveling.
- **Camera installation position:** right in the middle of the vehicle body, at the top of the vehicle.
- **Camera installation angle:** the lower edge of the field of view is tangent to the vehicle body ,symmetry left and right.
- Cameras should be installed at the similar height as possible to achieve the best stitching effect. (Self-assessment can be made according to the vehicle type)
- The camera is firmly installed to ensure that it will not be loose after use.
- How to obtain static lane lines:
  - 1. Simulate using PVC white tape
  - 2. Painting and scribing can be used.

Advantages: No need to drive on the road, suitable for vehicle installation process



Placement Requirement for Calibration Cloth

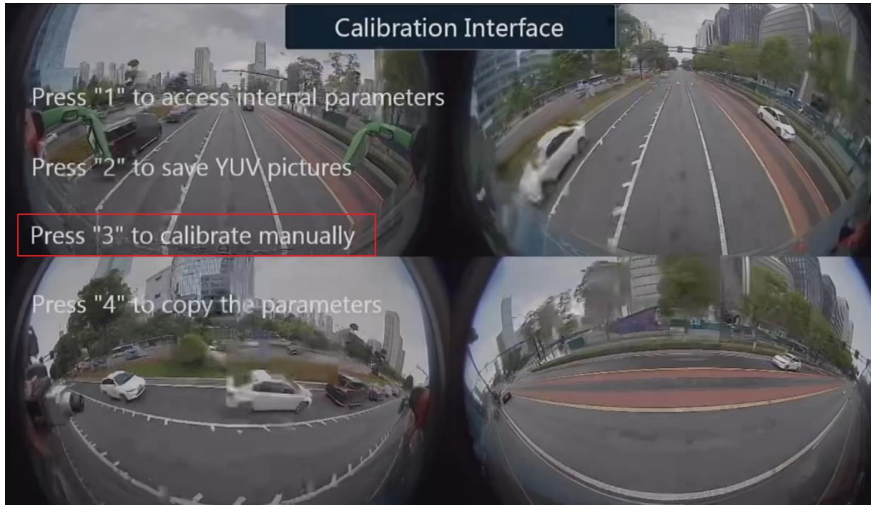
Calibration Method 2: Static Road calibration-Remote Control Calibration

Enter calibration mode

1.Press the "MENU" button of the remote control,

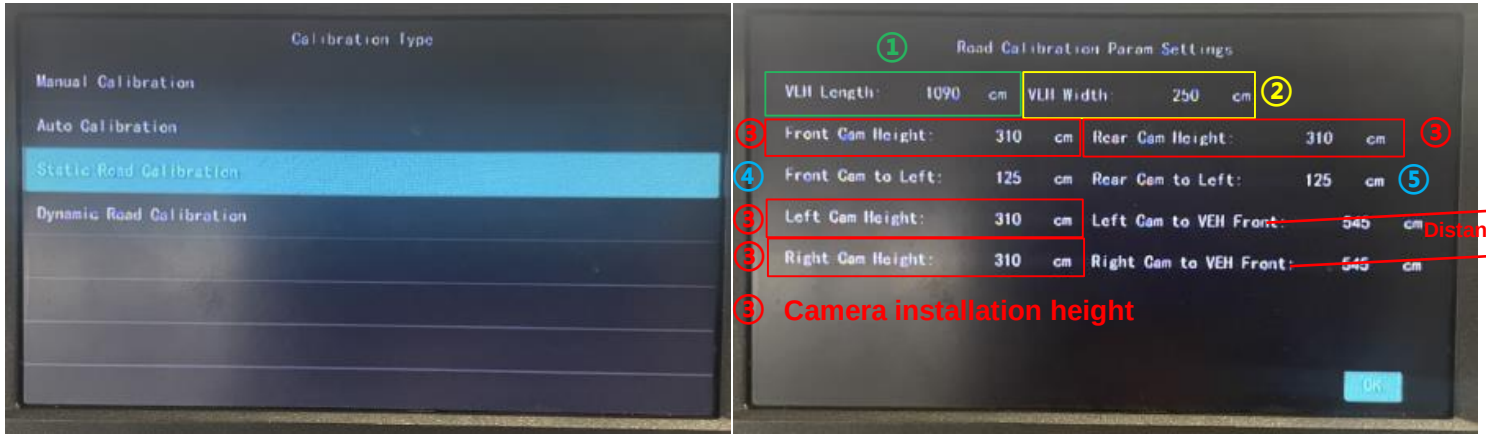
2.Click the number "6" six times,

3.Press the number "3" to enter the calibration mode selection.



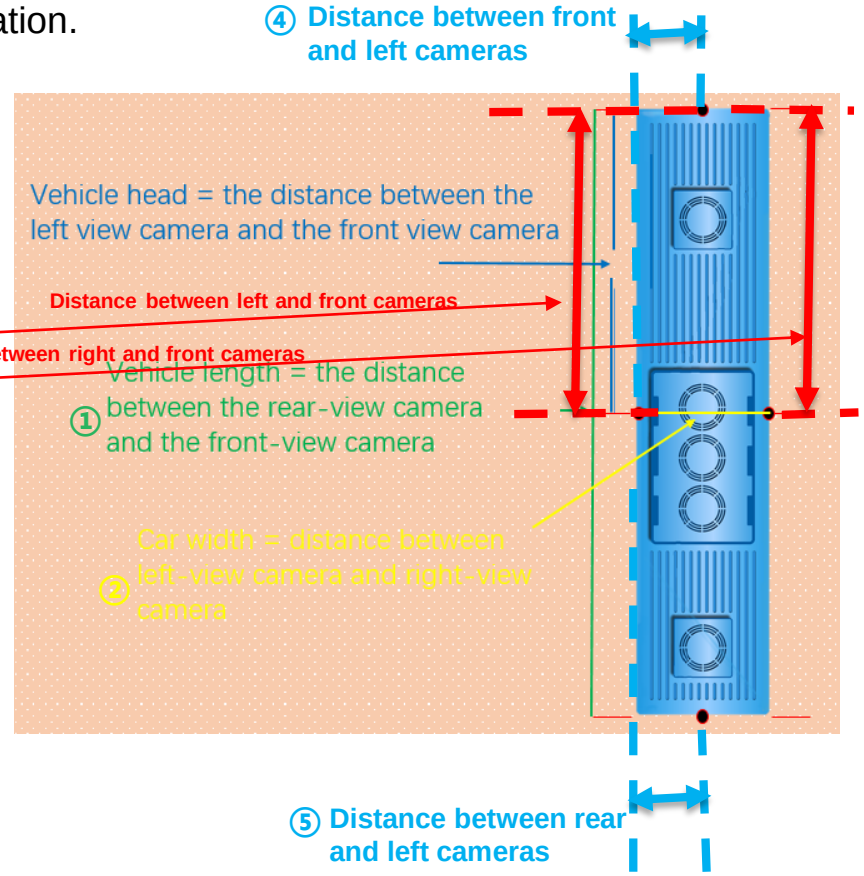
Calibration Method 2: Static Road calibration-Remote Control Calibration

- Static road calibration is a scheme of setting 2 lane lines in the field and then calibrating.
- When selecting static road calibration, it is necessary to use the calibration cloth imitating the road route. The distance between the vehicle body and the white line is 150cm, and the length of the white line exceeds 400cm before and after the vehicle body. After confirming that the calibration cloth is correctly placed, you can point to this interface for static road calibration.



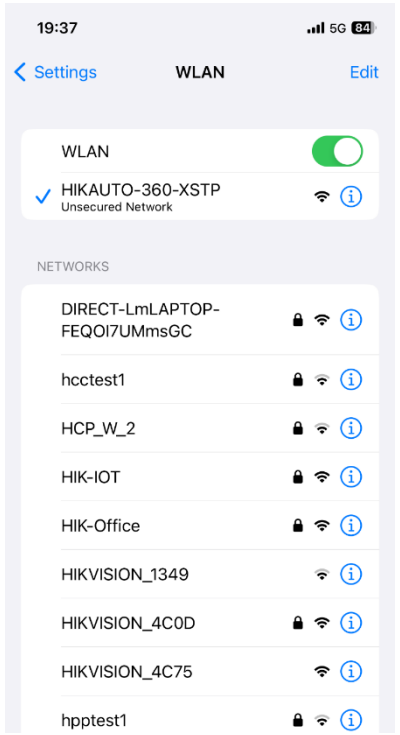
①Select **Static Road Calibration** and click confirm

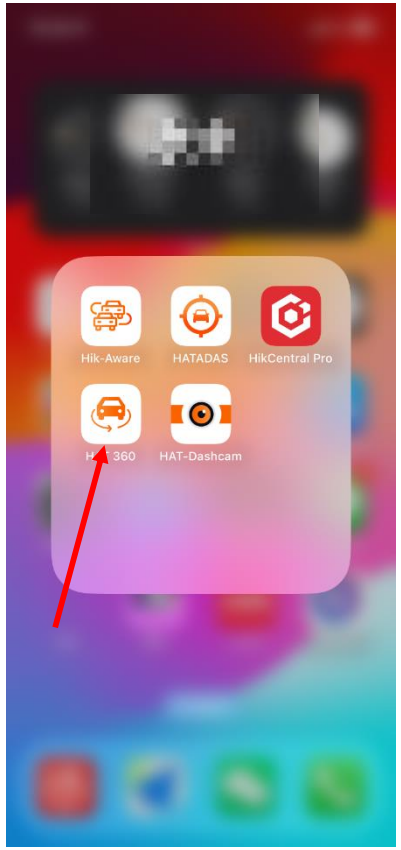
②Control the cursor movement through the directional keys , and enter the vehicle data, and then select OK option and confirm, Then the device will start calibration and wait for a few minutes to complete the calibration(Eliminate data with button C)

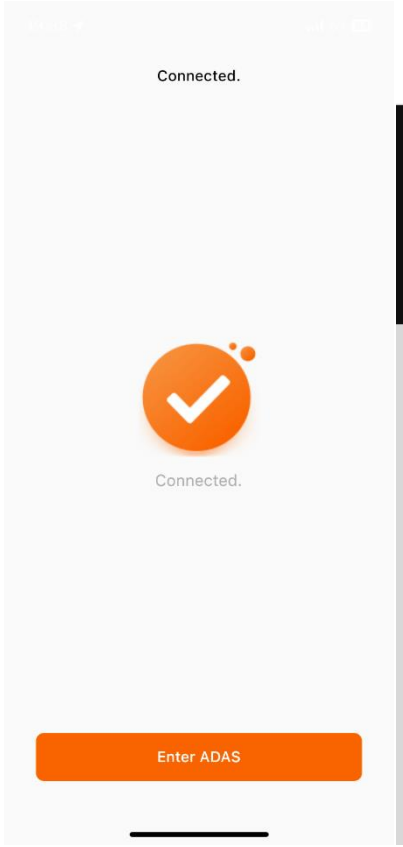


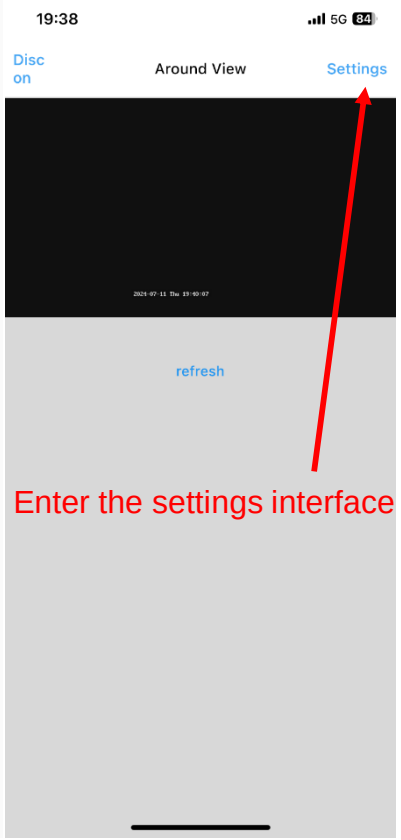
Calibration Method 2: Static Road calibration-APP Calibration

Insert the Wi-Fi module into the USB interface, find the wifi name starting with HIKAUTO-360*** and connect without entering a password.

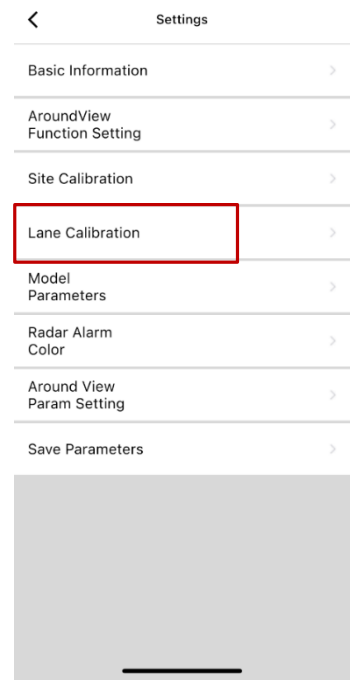






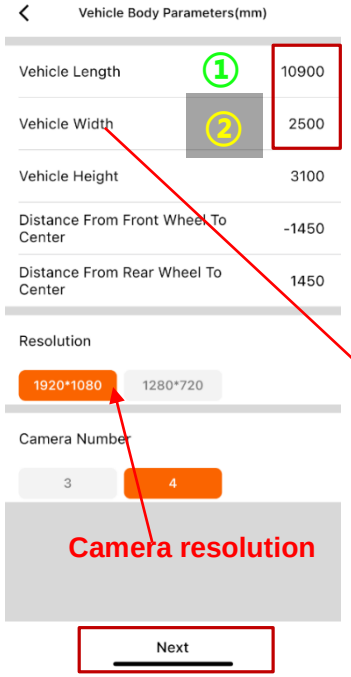


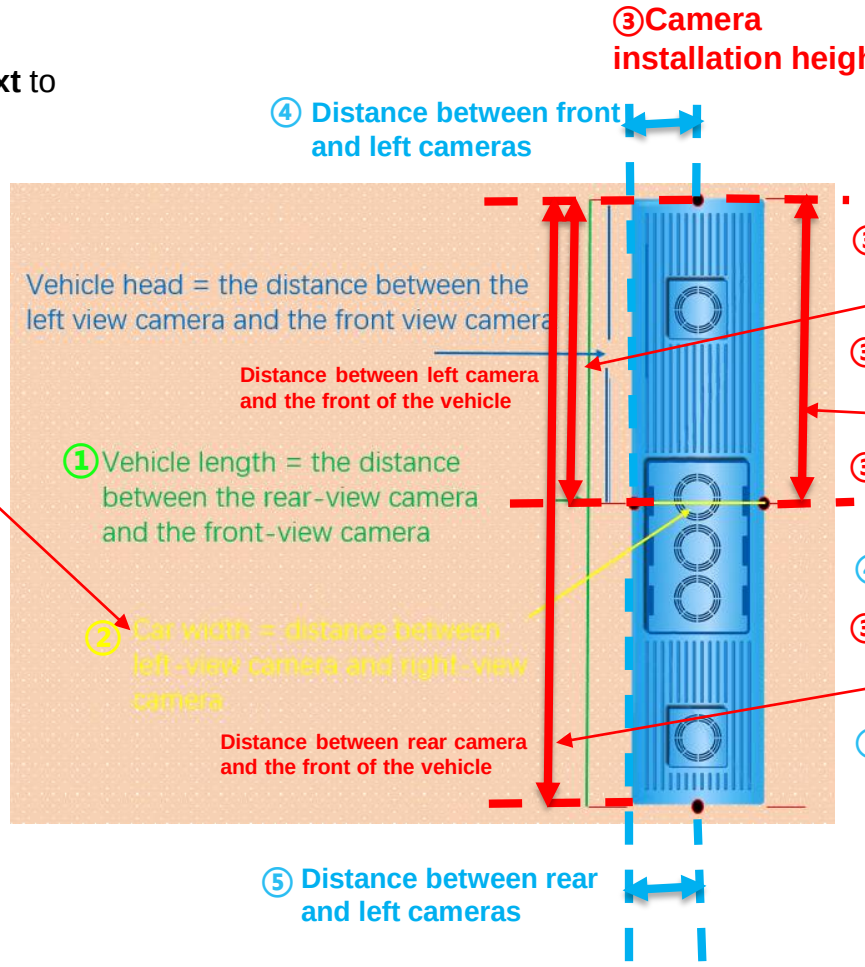
①Select **Lane Calibration**



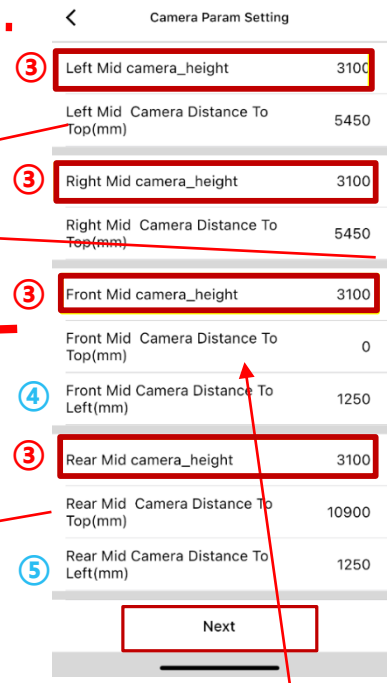
Calibration Method 2: Static Road calibration-APP Calibration

②Enter the vehicle parameters and click **Next** to proceed to the next step





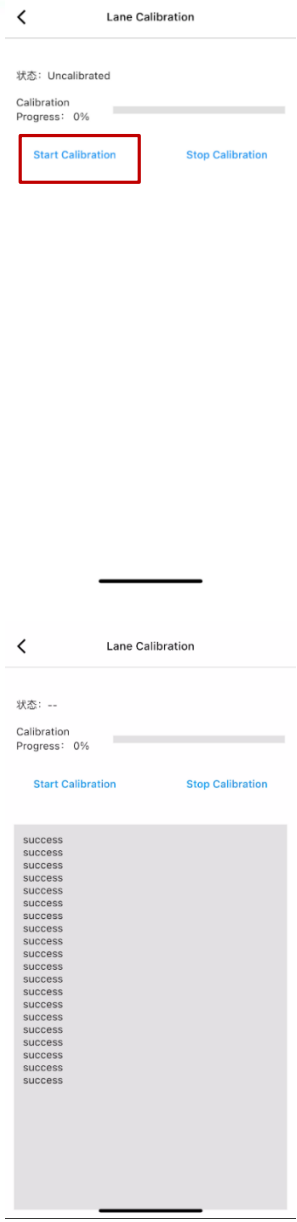
③Enter the vehicle parameters and click **Next** to proceed to the next step



Distance between right camera and the front of vehicle

④Select **Static Schedule** according to the calibration method and click Save

⑤Click on **Start Calibration** to start calibration, wait for a few minutes and the calibration will be successful



Calibration Method 3: Dynamic Road calibration

- Calibration cloth preparation
  - **Requirements for calibration cloth:** No calibration cloth (just use lane width).
  - The criteria are as follows:
    - Try to calibrate on a long solid line and the vehicle speed is between 0 km/h and 30 km/h.
    - Intersections and virtual and real lines have no influence.

- **Site requirements:** leveling.
- **Camera installation position:** the highest vertical center line on all sides of the vehicle body.
- **Camera installation angle:** the lower edge of the field of view is tangent to the vehicle body ,symmetry left and right.
- Cameras should be installed at the similar height as possible to achieve the best stitching effect. (Self-assessment can be made according to the vehicle type)
- The camera is firmly installed to ensure that it will not be loose after use.

Advantages: No need to place calibration cloth

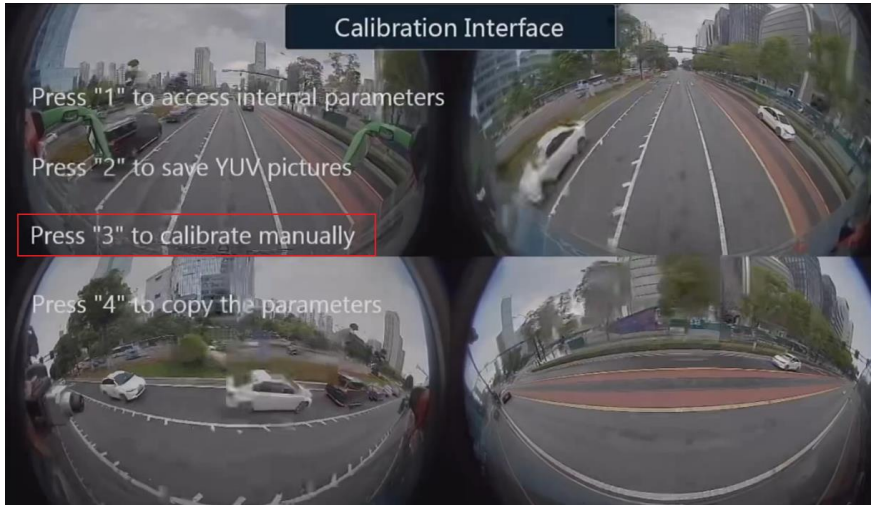
Calibration Method 3: Dynamic Road calibration-Remote Control Calibration

Enter calibration mode

1.Press the "MENU" button of the remote control,

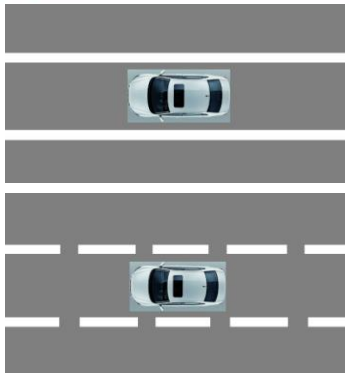
2.Click the number "6" six times,

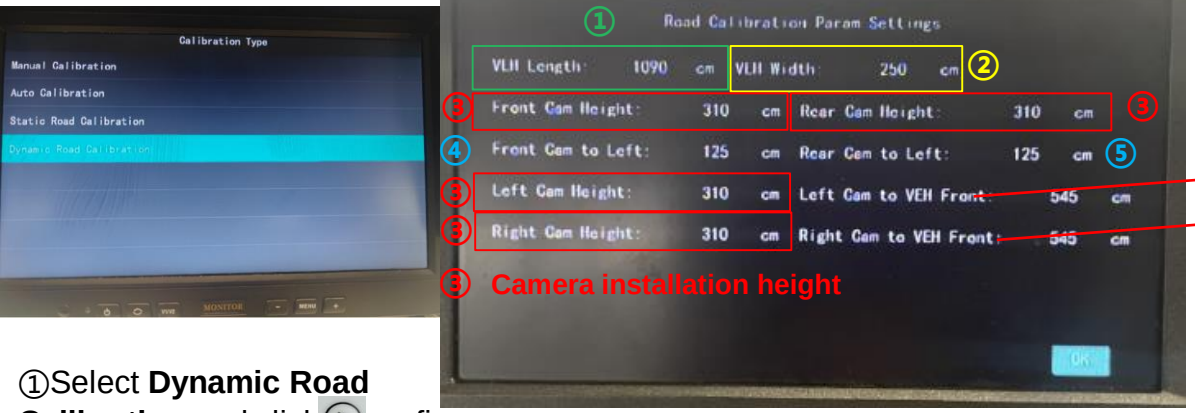
3.Press the number "3" to enter the calibration mode selection.



Calibration Method 3: Dynamic Road calibration-Remote Control Calibration

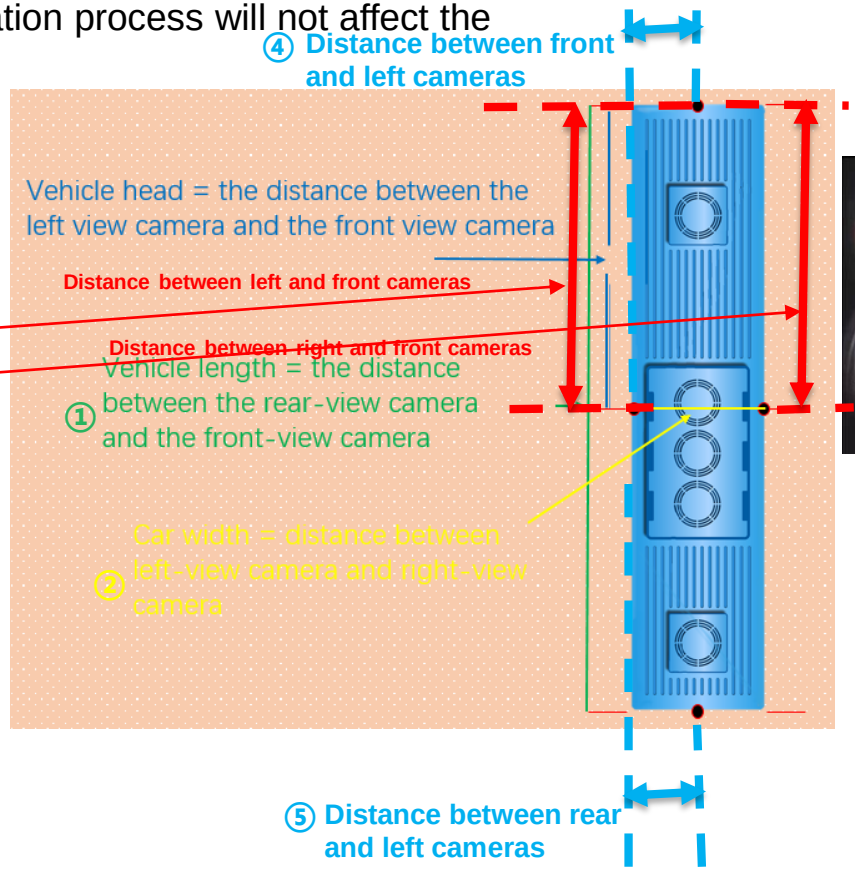
- Dynamic road calibration is a scheme in which calibration happens when the vehicle runs on the outer area.
- In the process of dynamic calibration, the vehicle needs to be calibrated when driving at a constant speed of 0-30KM/h, and it can be calibrated automatically in a few minutes.
- Intersections, solid and dotted lines encountered in the calibration process will not affect the calibration.





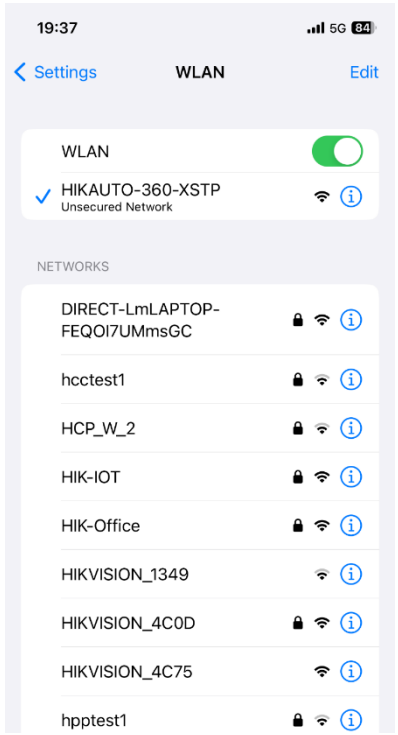
①Select **Dynamic Road Calibration** and click ▶ confirm

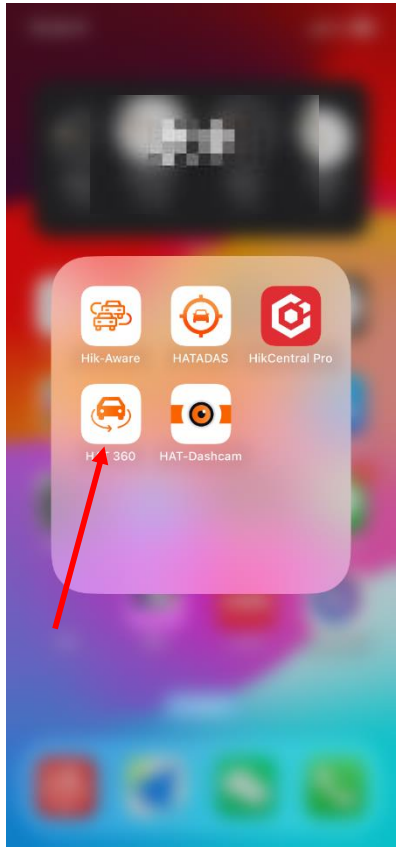
②Control the cursor movement through the directional keys ◀◀ ▶▶ , and enter the vehicle data, and then select OK option and confirm ▶, Then the device will start calibration and wait for a few minutes to complete the calibration(Eliminate data with button Ⓒ)

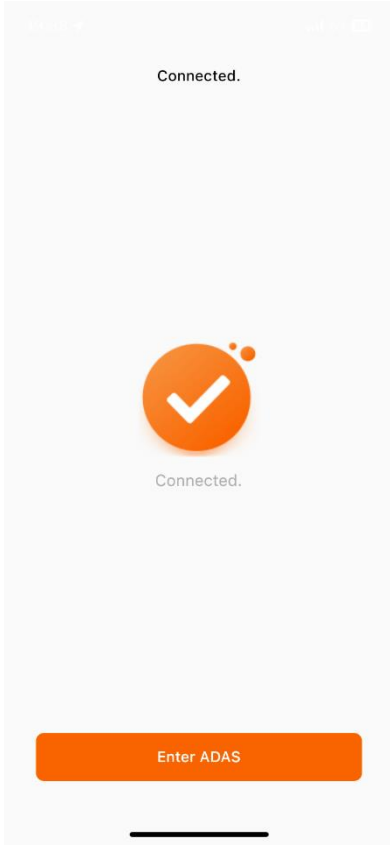


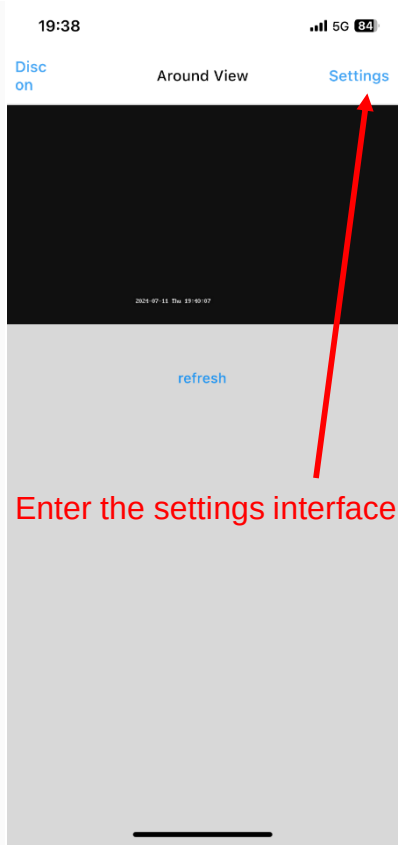
Calibration Method 3: Dynamic Road calibration-Remote Control Calibration

Insert the Wi-Fi module into the USB interface, find the wifi name starting with HIKAUTO-360*** and connect without entering a password.

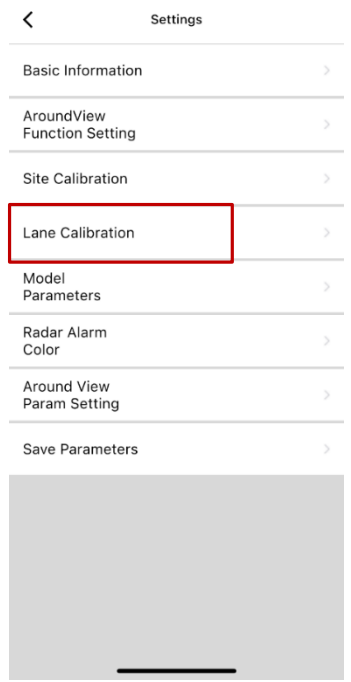






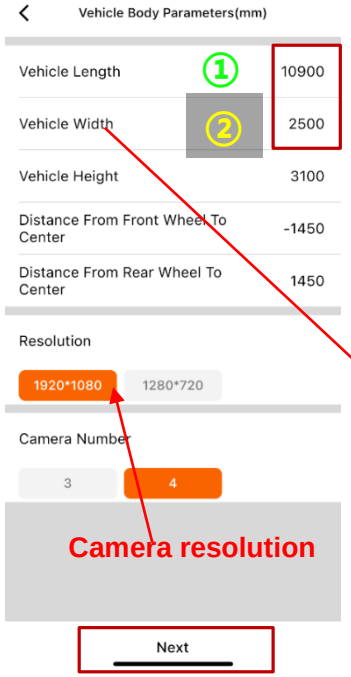


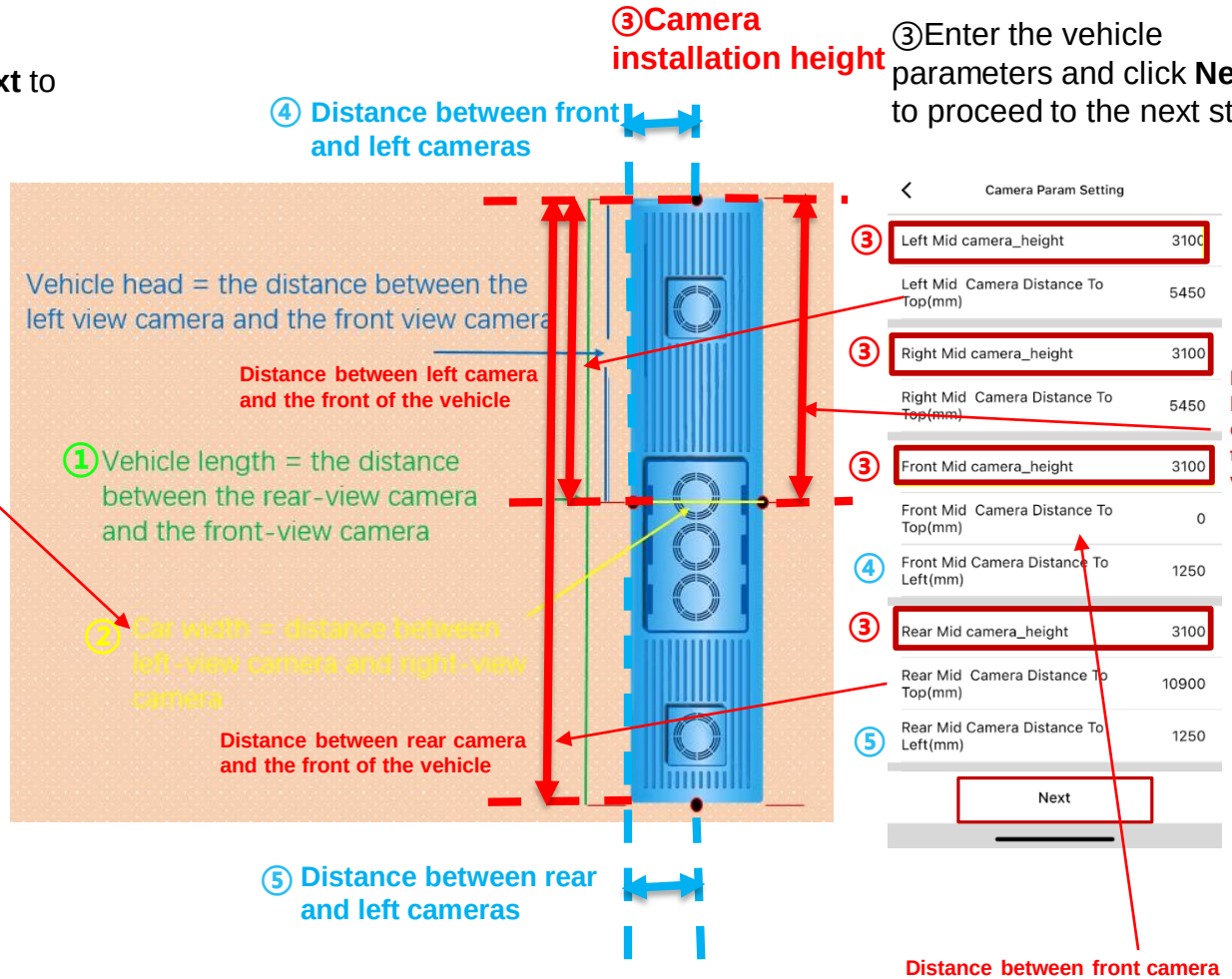
①Select **Lane Calibration**



Calibration Method 3: Dynamic Road calibration-Remote Control Calibration

②Enter the vehicle parameters and click **Next** to proceed to the next step



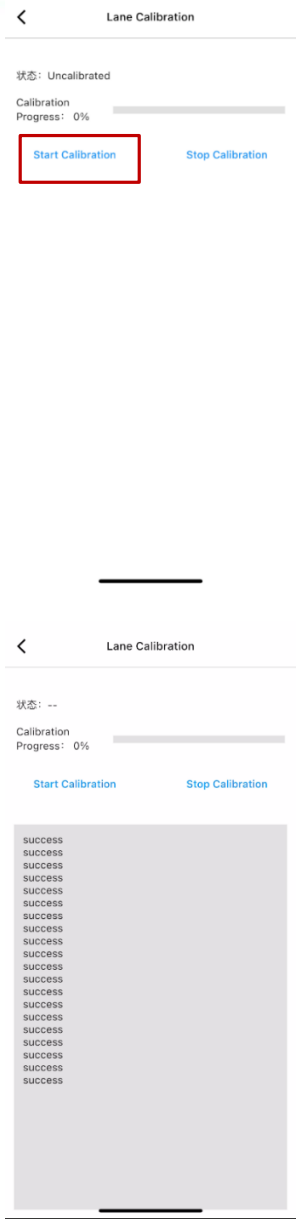


③Enter the vehicle parameters and click **Next** to proceed to the next step

Distance between right camera and the front of vehicle

④Select **Dynamic Schedule** according to the calibration method and click Save

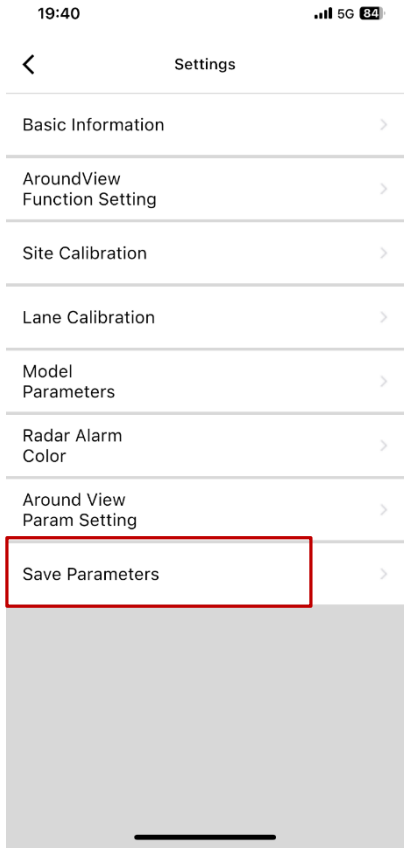
⑤Click on **Start Calibration** to start calibration, wait for a few minutes and the calibration will be successful



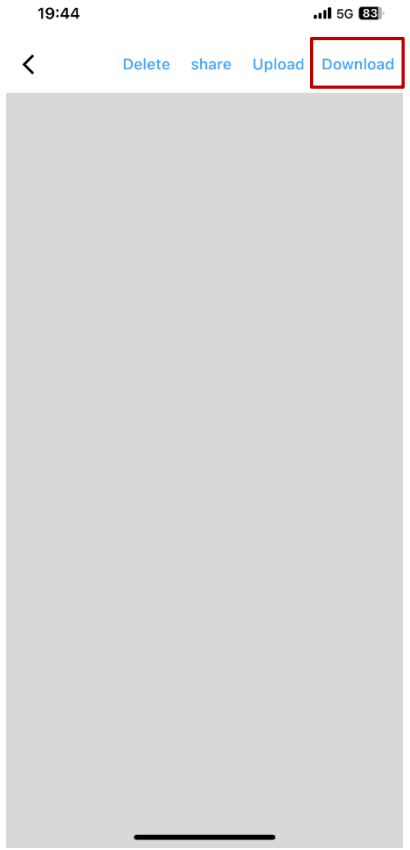
Contents

Batch calibration

Batch calibration of 360AVM with the same installation vehicle, position, and angle can be completed by exporting configuration files and then importing them

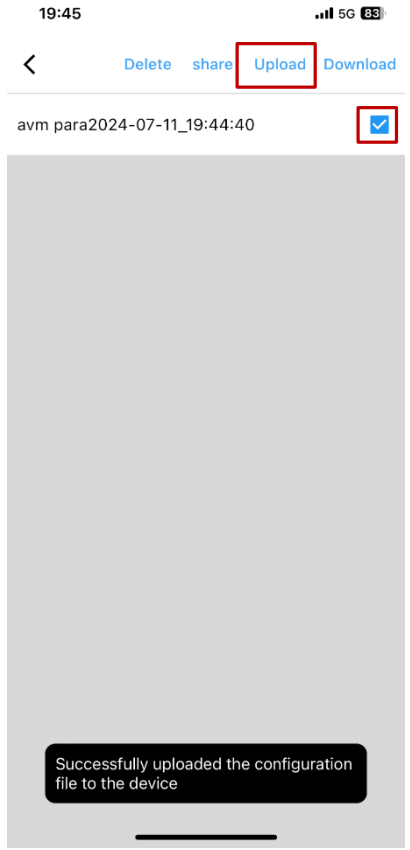


①Select **Save Parameters**



②Click the **Download** button to download the calibration file

③ After connecting to another 360AVM, enter the **Save Parameters** interface



④After selecting the calibration file, click **Upload** to complete the calibration

Upgrading

1. factory.bin: uboot upgrade package/firmware package
2. digicap.dav: online upgrade package

Upgrade time: 5 minutes.

Uboot upgrade:
Copy the factory.bin into the root directory of TF card（FAT32），
Insert the TF card
Power on the device again (no upgrade prompt).
factory.bin needs to be deleted manually.

Online upgrade:
Copy digicap.dav into the root directory of TF card, the device will recognize the upgrade package, and the GUI will prompt the upgrade choice for the user. Upgrading progress will be displayed and the upgrade package will be automatically deleted.

Note:
1. There is no limit to the capacity of TF card

FAQ about Preview Images

(1) **Split Screen**

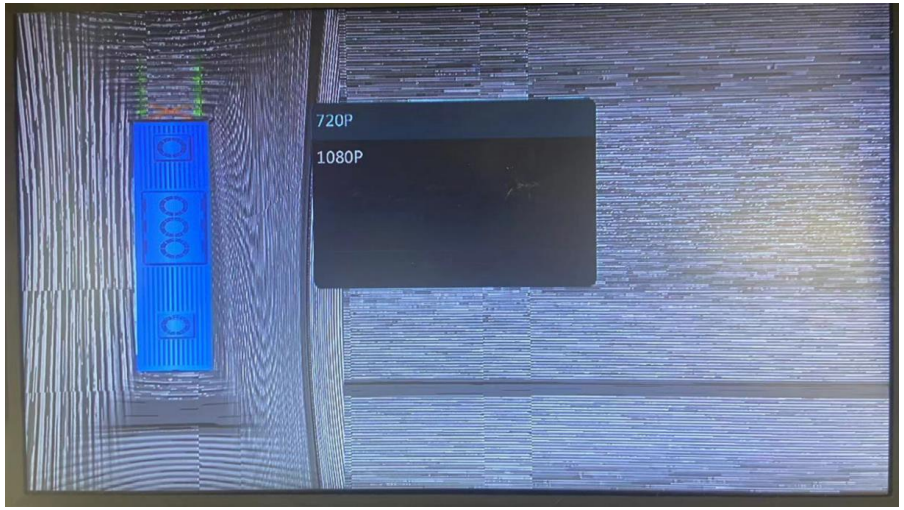
Cause: the mismatch between the camera standard and the 360 host.

Solution: on the remote control, press Menu->Settings->Camera Type, and switch between AHD/TVI to find the corresponding camera standard.

(2) **Blurred Screen**

Cause: the mismatch between the camera resolution and the 360 host.

Solution: on the remote control, press Menu->Settings->Camera Resolution, and switch between 720P/1080P.



FAQ about Preview Images

(3) **Black/White Image of the Screen**

Cause: the mismatch between the screen output standard of the around view controller and the 360 host.

Solution: on the remote control, press Menu->Settings->Screen Output Format, and switch among AHD/TVI/CVBS to find the corresponding screen output standard.

(4) **Black/White Image of the Camera**

Cause: the mismatch between the resolution of the camera and the 360 host.

Solution: on the remote control, press Menu->Settings->Camera Type, and switch between AHD/TV to find the corresponding camera standard.

HIKAUTO

THANKS

Hangzhou HIKAUTO Technology Co., Ltd.

No.399 Danfeng Road, Binjiang District

Hangzhou, China

www.hikauto.com.cn