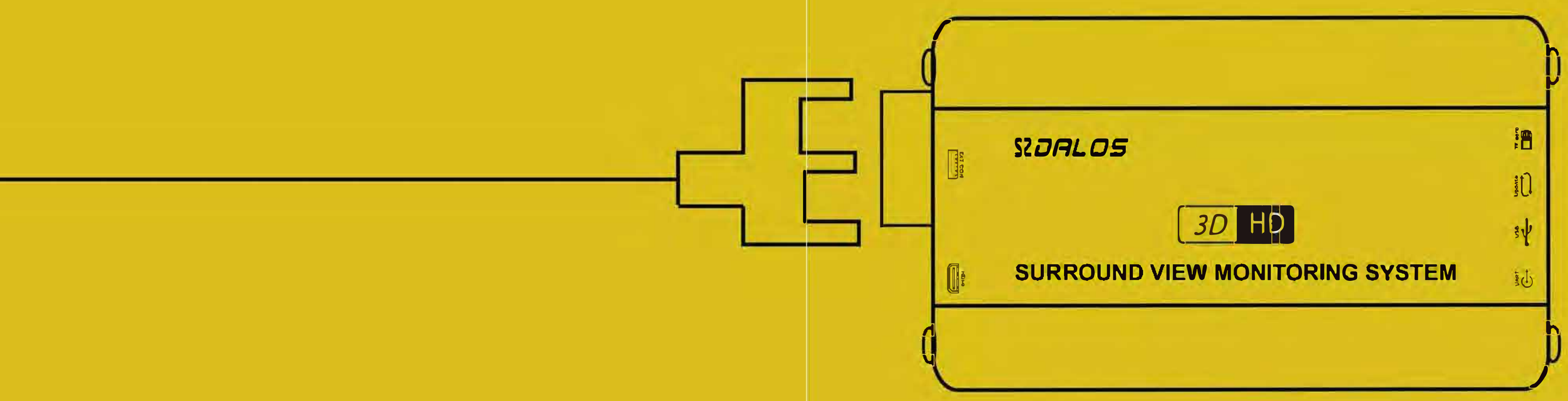
3D HD

DALOS

SURROUND VIEW MONITORING SYSTEM

User Manual



CONTENTS

Safety Tips

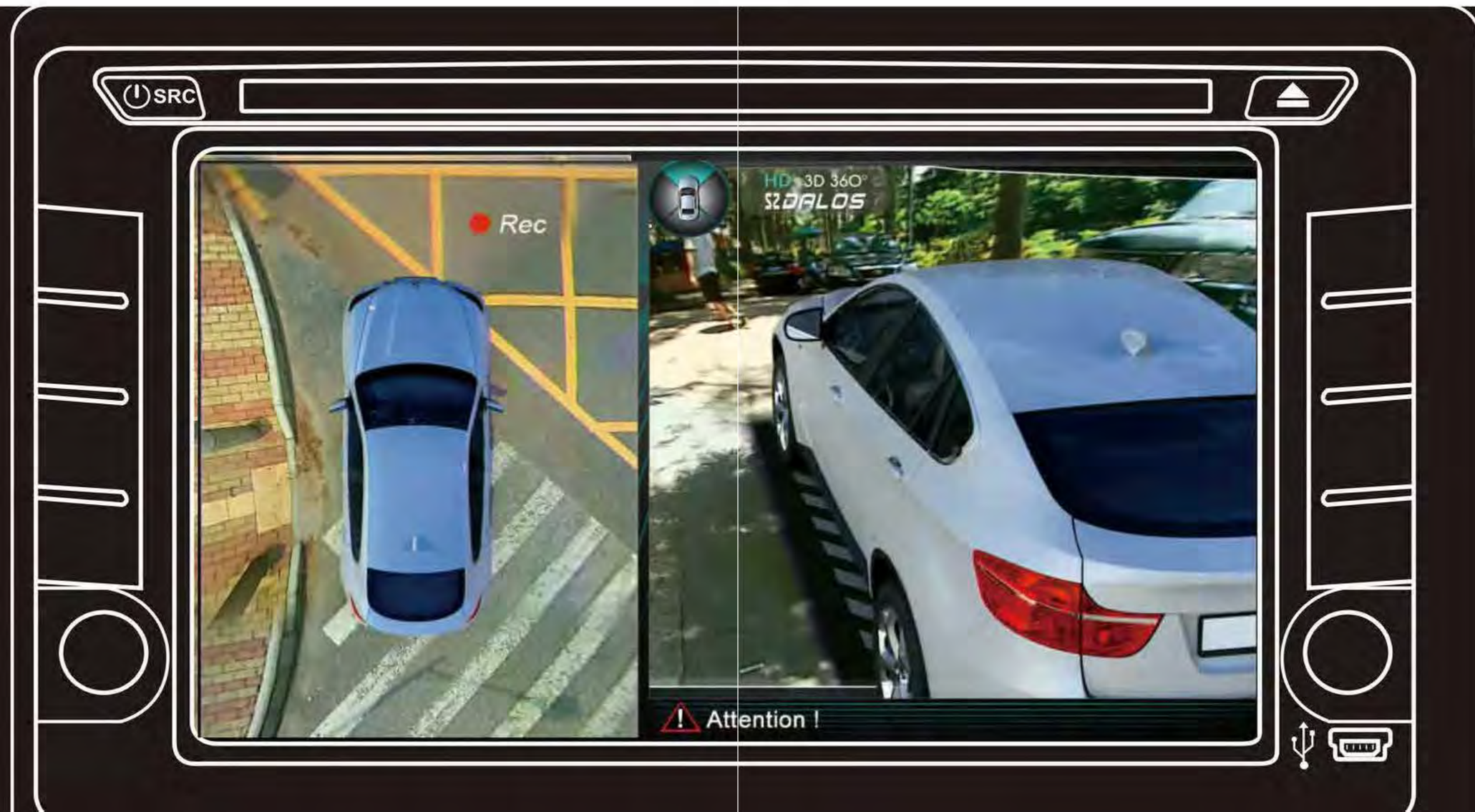
- Please read this manual carefully before using and pay attention to this section for the safety Instructions.

- It is strongly recommended not to operate this system while driving.

- SZDALOS 3D HD SVM system is a parking and driving assistant system which offers the road situation around the vehicle to eliminate blind spots and thus works perfectly as a visual guide for safe parking and driving. There may be a slight difference between the screen image content with actual surroundings of the vehicle. Please handle this case according to actual situation.

- Never unplug the host device when power is connected. The host device can't be sinked in any kind of liquid. Beware of the heat dissipated on the host device during operation.

- It is recommended to have this system installed by an authorized installer.



Brief Introduction

Guide

This guide provides the basic illustration of the SZDALOS 3D HD SVM system, operating principle and basic concept to help users to understand the whole system installation procedure, camera calibration steps, and how to interact with the system menu.

Brief Introduction of System

The SZDALOS 3D HD Surround View Monitoring Technology synthesizes images from four cameras to create a true 3D sophisticated view of a vehicle's surroundings. The technology enables flexible omni-directional monitoring around a vehicle from a dynamically definable perspective." Such technology can display the complete vision of the positioning and moving path of the vehicle, it covers blind spot and thus works perfectly as a safe parking and driving guide even when restricted by adjacent vehicles and objects, parking line, etc. The system offers various SVM system configurations like -HDMI/LVDS/AV with alternative version of 2D or 3D. Additionally, this system also integrated full channel car DVR function with 24 hours videos loop recording.

Product Features

- Four 180 degrees ultra wide fish-eye cameras
- Seamless video merging based on dual core ARM CPU and hardware high efficiency acceleration engine.
- Arbitrary and dynamic 3D mode angle switching for better surrounding environment observation
- Independent Fish-eye calibration parameter and algorithm for each camera.
- 3D video de-interlacing and noise reduction technology for CVBS signal decoding.
- Supports alternative recording via TF card and USB disk
- The simplest calibration steps with calibration tape and packing box.
- Smart power management for a more effective consumption.
- High video recording resolution up to 1080p
- OE quality for main chipset with well protected circuit and devices in order to achieve the best system performance and stability.

Product Features

Main application scenarios


Side parking


Reverse parking


Narrow Road/Lane


Slope pathway


Blind Spots Coverage


Turning assist


Crowded Road


Car DVR


Evidence during road accident

Features Profile

3D & 360° Seamless Merging

360° Blind Spots Coverage

Dynamic & Intelligent View Angle Switching

Flexible Omni-directional Monitoring

Exclusive Fish-eye Distortion Correction

Guided Camera Calibration

Optional Function

a.Driving Video Recording

b.24 Hour Parking Monitoring

c.G-sensor Triggered Recording

d.Visual Radar Extension

Note:

This manual gives a basic and general feature description of the system, but it may vary from specific product model and application case. Please consult our sales team for more detailed information.

System Hardware Installation

Installation Steps

1 Wire routing inside the car

Please refer to wiring diagram for more details.
Please also be alert for the color and connector size of each cable.
Wire routing should start from cameras to the host device side.
All the cables should be gathered to the host device side

2 Cameras Installation

Please refer to the corresponding section for detail installation steps.
Embedded or external installation for side cameras depends on the size of the side mirrors and also depends on the space available for installation especially for large vehicles.
Pay attention when disassemble the side mirrors to protect it from being broken, and please also be careful when drill installation holes under the plastic cover of the mirrors.

3 Host Installation

It is strongly recommended for the host to be installed inside/behind the glove box for easy remove of TF card or USB disk.

4 Wiring Test

Do not turn on the power before all the wires are connected correctly. Do not unplug the device when powered on.

5 Functional Test

To test the main functions and settings of the host device.

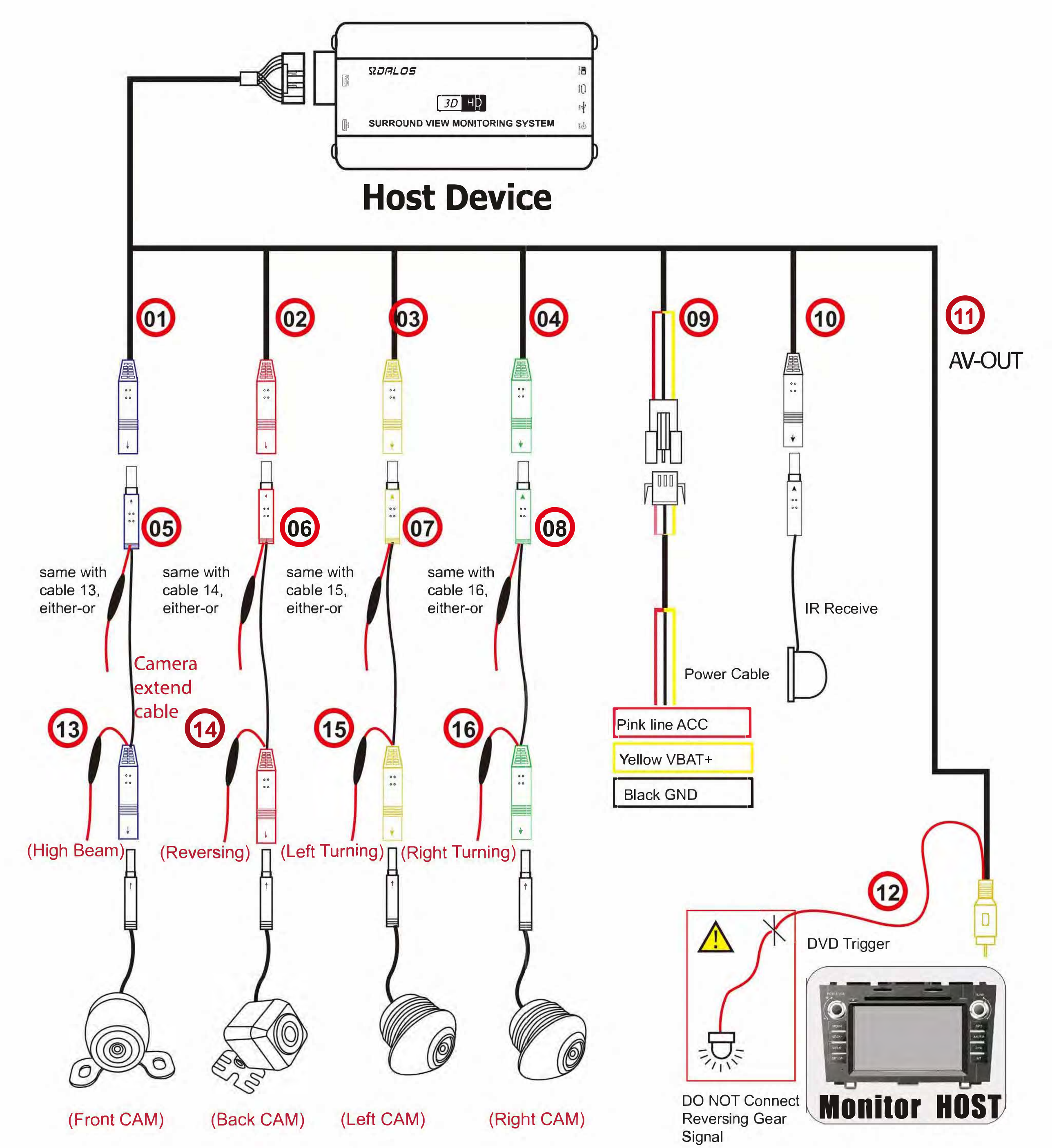
6 Side Camera's Angle Adjusting

Rolling the camera to select a proper angle to be aligned with the reference guide line on the screen.

7 Camera Calibration

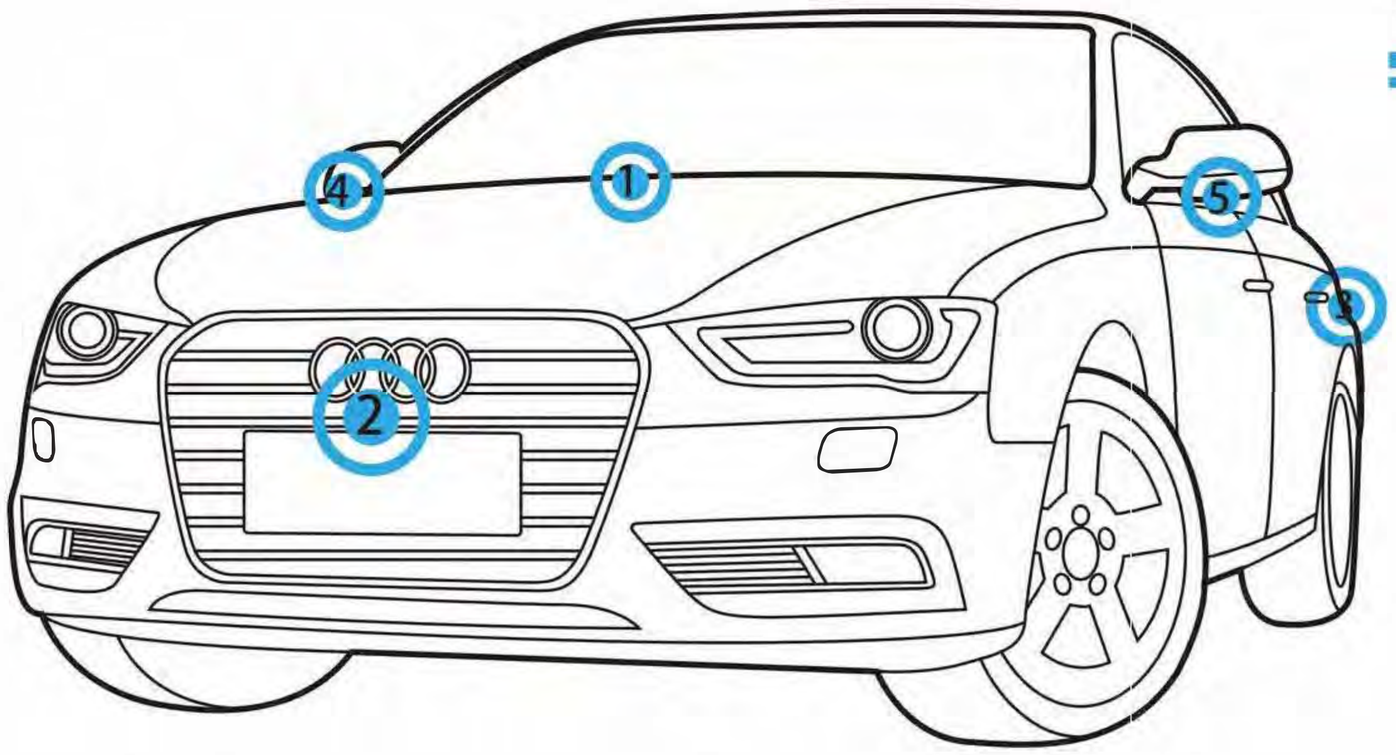
Camera calibration can be guided step by step with the help of system menu, once the calibration data is completely collected, system software will complete the video merging automatically.

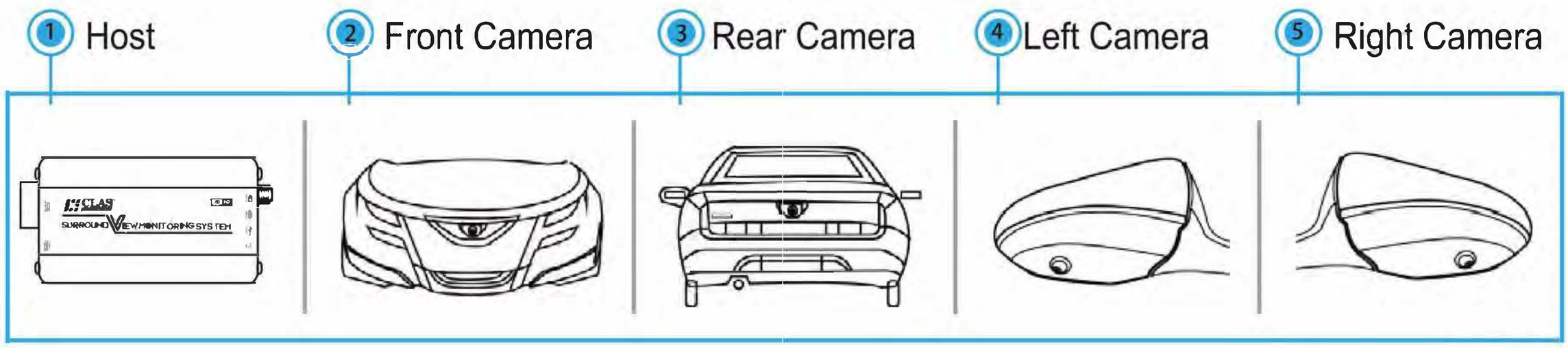
Wiring Diagram



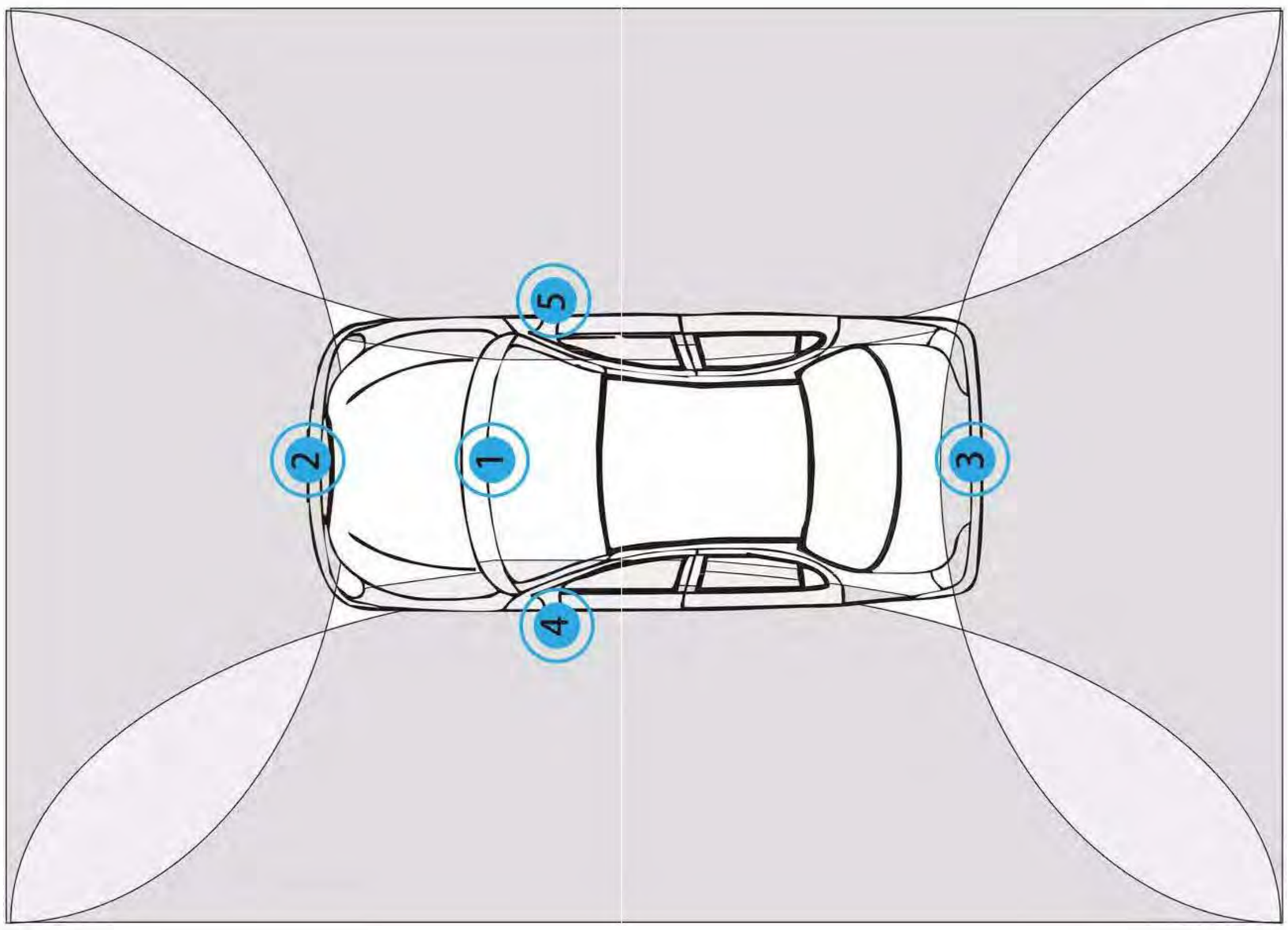
Cameras Distribution

Schematic Drawing



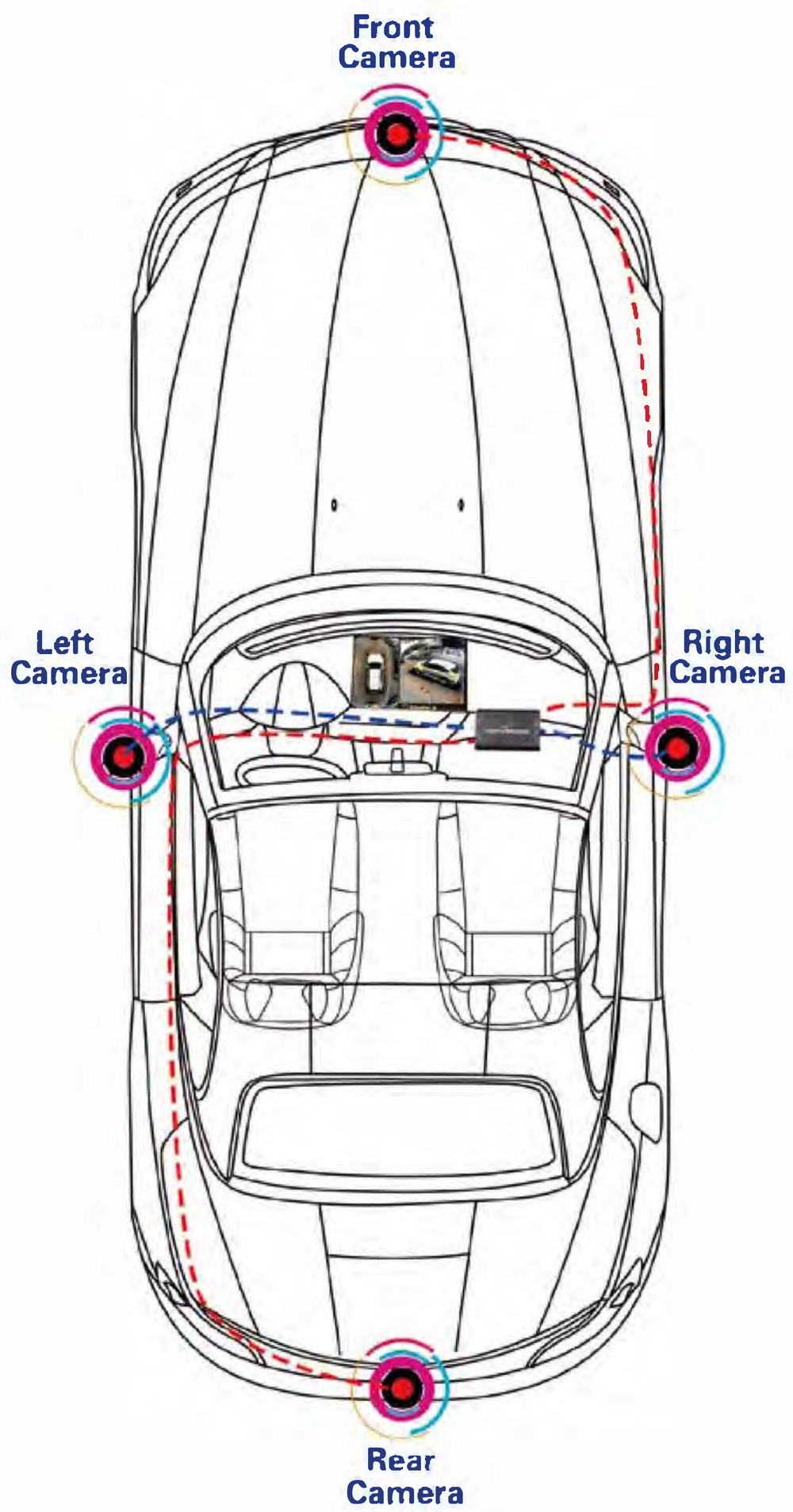


Top view



Wire Routing Flow Chart

Wire Routing & Process



Front Camera

1.Disassemble the glove box
2.Distribute the cable of front camera from the car logo position and go along with the original wire distributing tube to the glove box position.

Rear Camera

1.Disassemble the inner panel of the trunk.
2.Distribute the cable of the rear camera from the license plate lamp and go along the original wire distribution tube to the glove box position.

Left and Right Cameras

1.Disassemble the side mirrors and remove the side trim panels of front doors
2.Disassemble the glass lens of side mirrors, extend the cables of side cameras from the original tube of side mirrors to the interlayers of the front doors.
3.Gathering all the cables from the interlayers of cab doors to the glove box position.

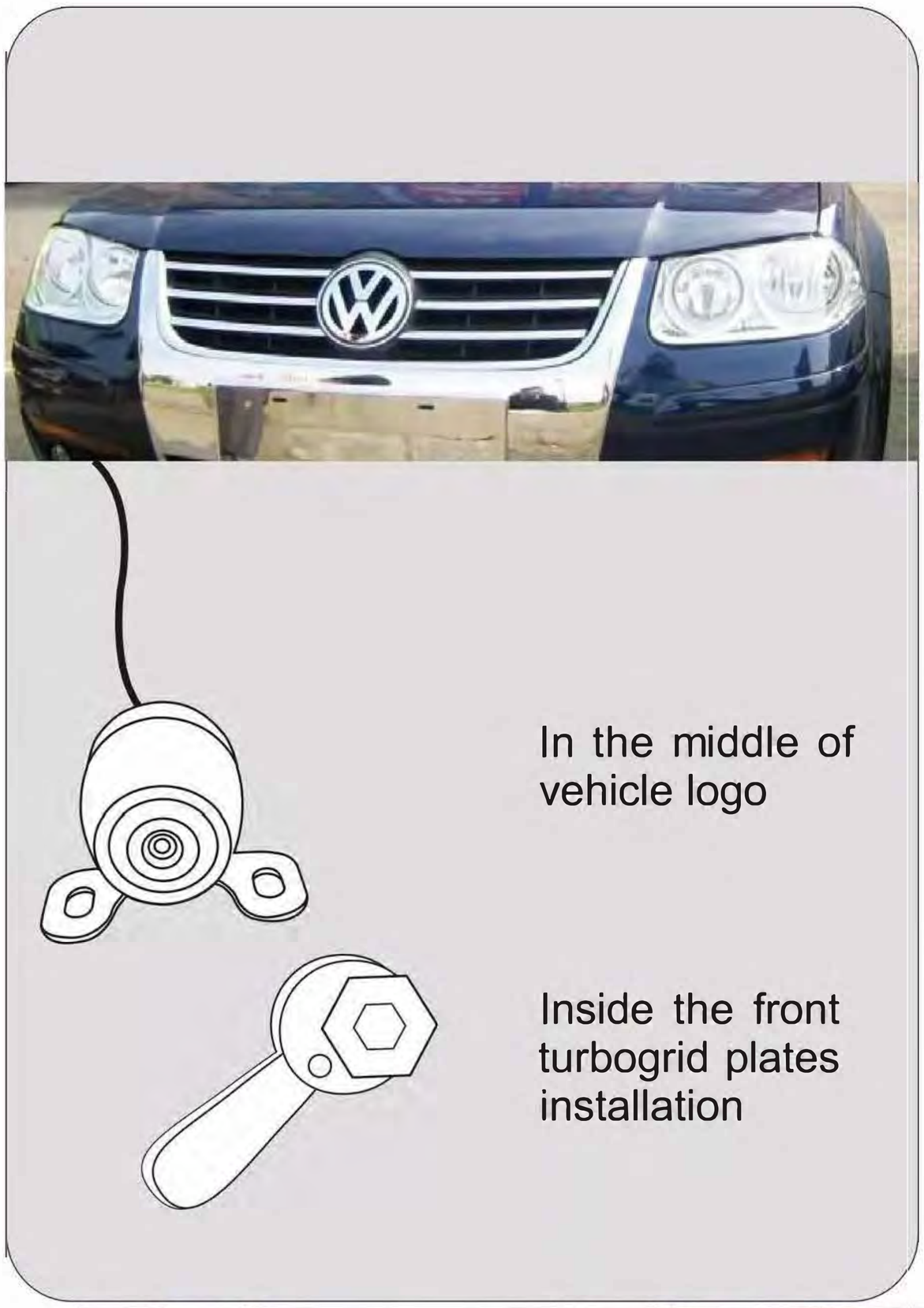
(Instructions on how to disassemble the two glass lens of side wing mirrors)

In General, Most of Japanese cars are has plastic-buckle structure for side mirrors, the inner upside part of the side mirror is a “L” shape buckle , while the bottom side is U-shaped. Using the flat plastic screw driver and gently insert to the middle bottom position to remove the glass lens, please pay full attention to protect it from being broken.

German cars usually use round head clip, the steps to disassemble the side mirrors is similar.

Camera Installation

Front Camera



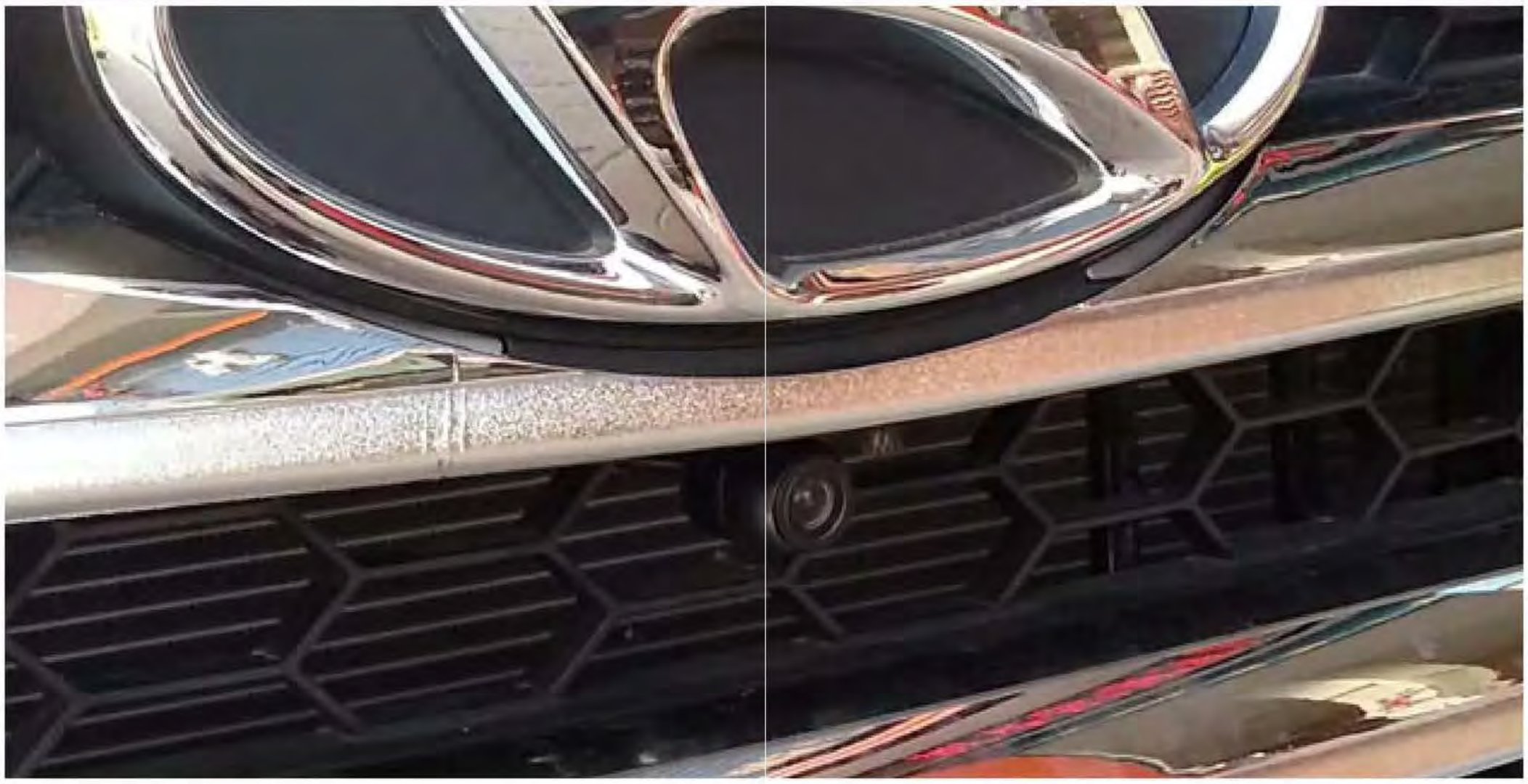
The Installation method of front camera:

1.Insert the front camera to the center of the front vehicle logo.

2.Connect the front camera with the cables.

3.Please double check the field of the view is wide enough from the system preview menu window, and the camera should not be obstructed by front bumper.

4.Fix the front camera with screw and the metal pad accessories.



Camera Installation

Rear Camera

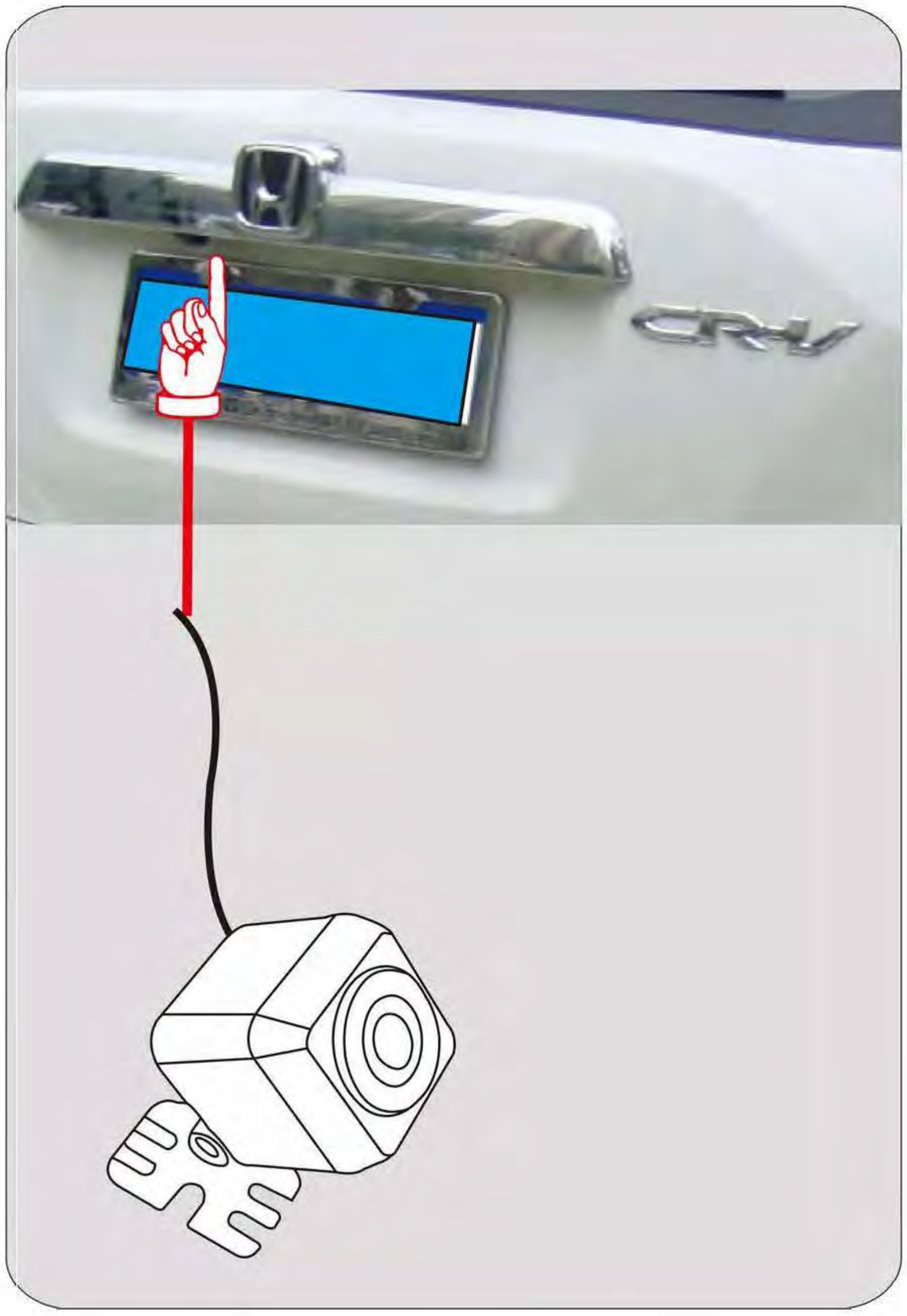
Rear Camera Installation Steps

1.Disassemble the inner panel of the trunk and take out the left license plate LED.

2.Stick locating plate of the rear camera in the right place for drilling a hole, and then drill a hole to install the camera on the position of the left side of license plate lamp.

3.Distribute the cable of the rear camera from the license plate lamp and go along the original wire distribution tube to the glove box position.

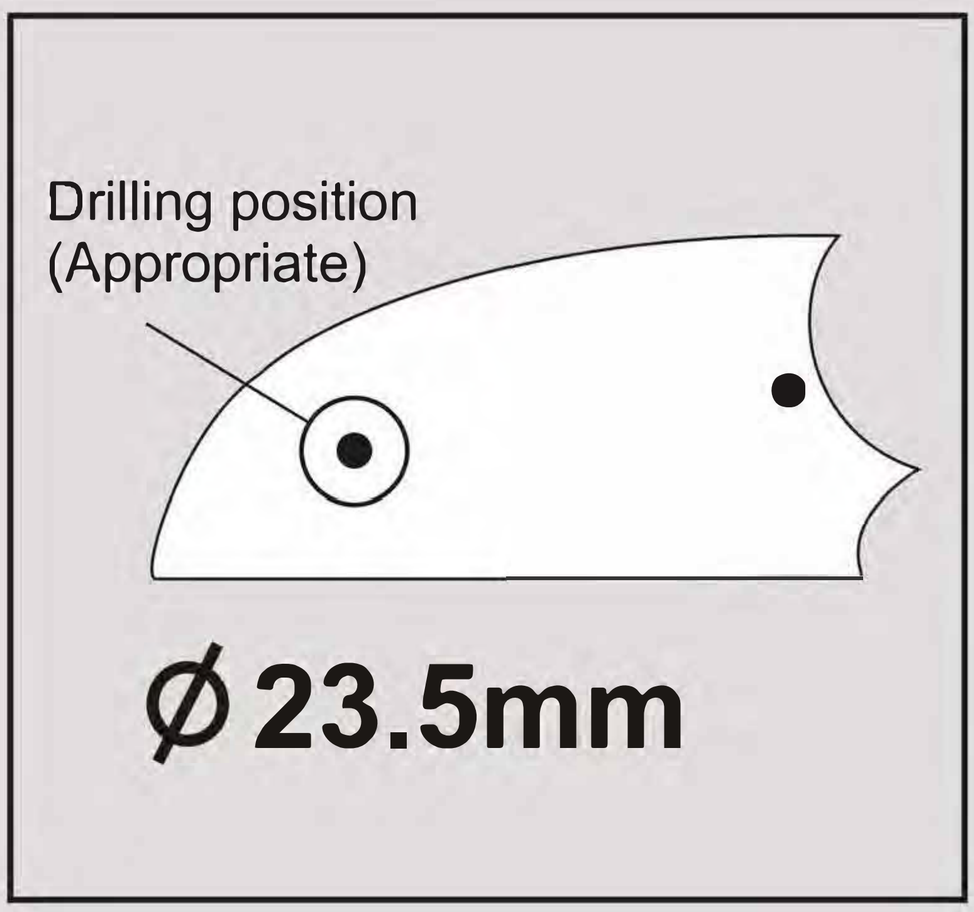
4.To connect reversing signal of the rear camera extending cable to the 12V +ve signal of the reversing lamp.



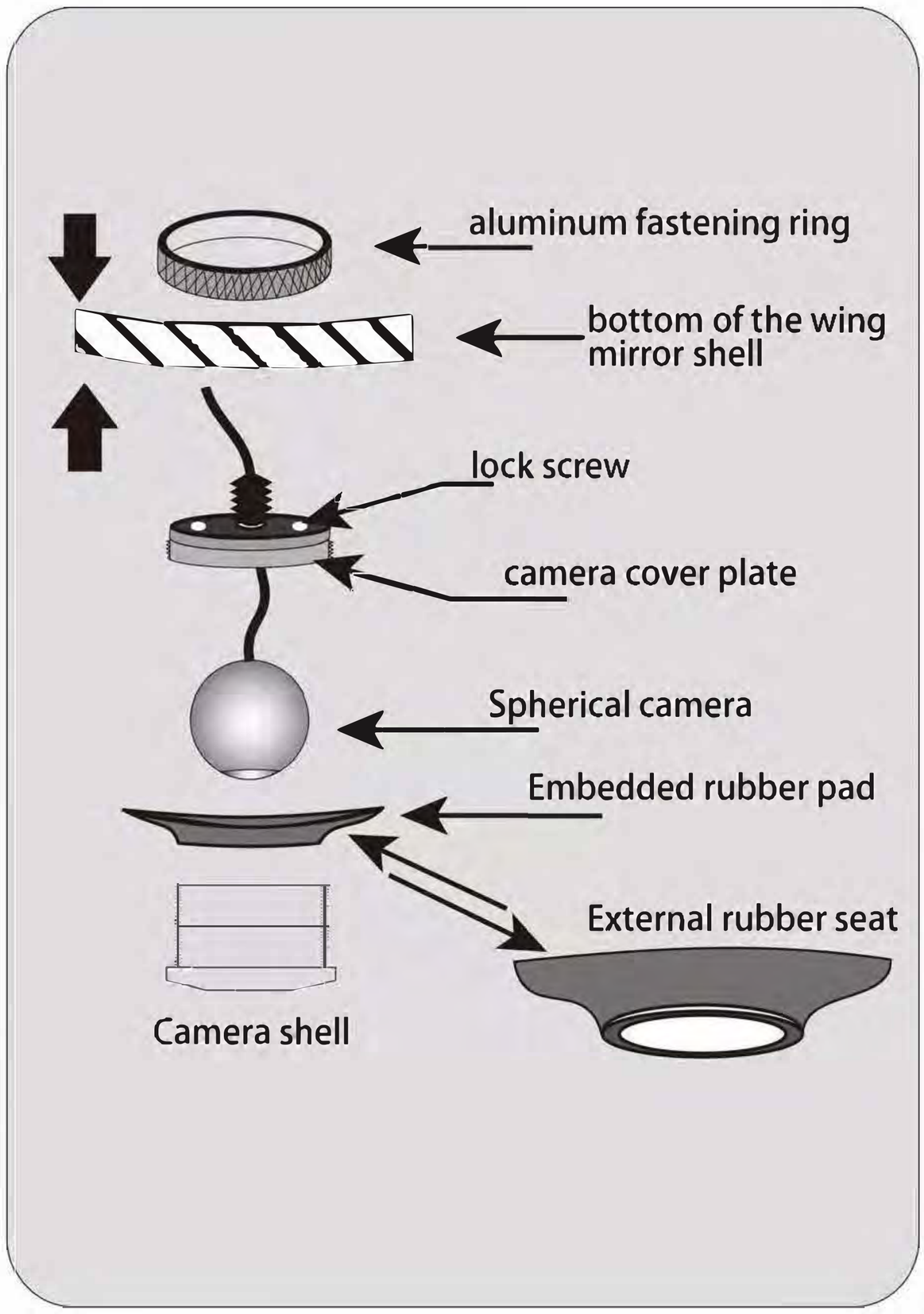
Camera Installation

Side Cameras

Drilling Location Diagram



Choose a proper drill bit according to the camera size
Find a flat area near to the edge of the wing mirror bottom plastic shell as much as possible for getting enough pixel content. You should leave enough spare space for the glass face of wing mirrors so that the glass face can be adjusted freely. Inaddition, keep in mind that camera field of view (FOV) should not becovered by the plastic shells.



Outboard installation

Embedded Installation

Right and Left Camera Installation

1.As shown in the left picture, stick the locating plate of the rear camera to the bottom of the side mirrors.

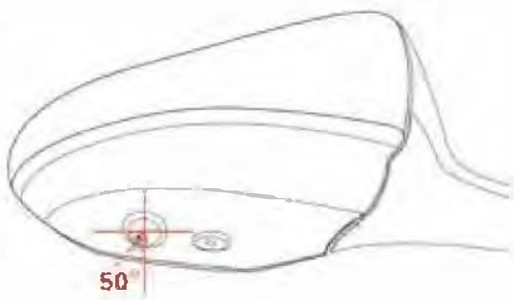
2.Using the corresponding drilling bit to drill holes at the bottom of plastic shell, and then tear off the positioning stickers.

3.Select the embedded mounting or external outboard mounting for side cameras according to the spare space of the plastic shell.

4.If the drilling location available in the bottom of the plastic shell is not flat, please use a rubber pad provided along with the product packing list.

5.Install the internal spherical camera core, and connect the cables, then lock screw of side cameras tightly but keep the spherical camera core of side cameras can still be rotated.

7.Open the center screen to see the preview image of the side cameras, keep in mind that keep the left calibration tap visible while get as many pixel as possible, and a another important comments is that keep all the calibration point distributed properly on the center screen. Recommended distribution is list blow.



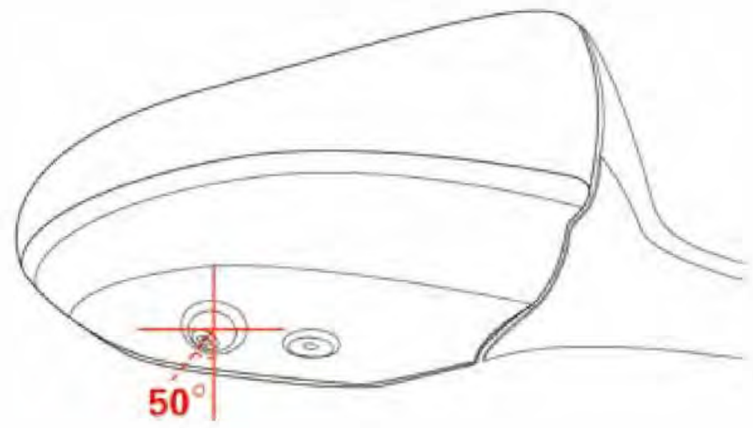
⚠ TIP ⚠

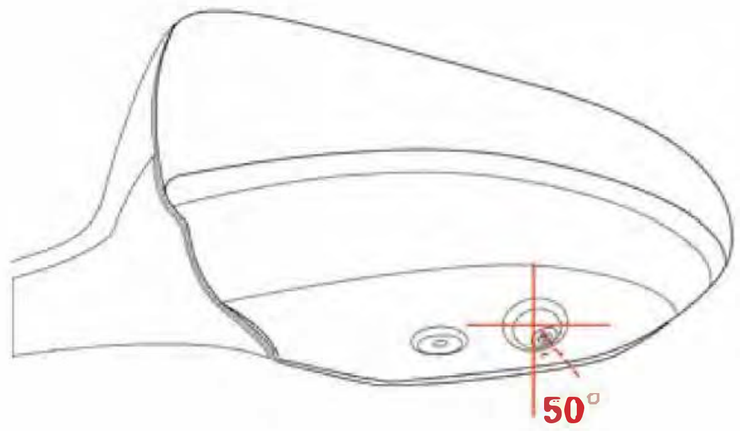
Drilling hole diameter of outboard mounting is "6mm", Drilling hole diameter of embedded mounting is "18 ~ 26mm", Please select the appropriate location to drill the hole for universal cameral models. And keep in mind that the glass face of the side mirror should be adjusted so that the embedded camera should not block the movement of the glass.

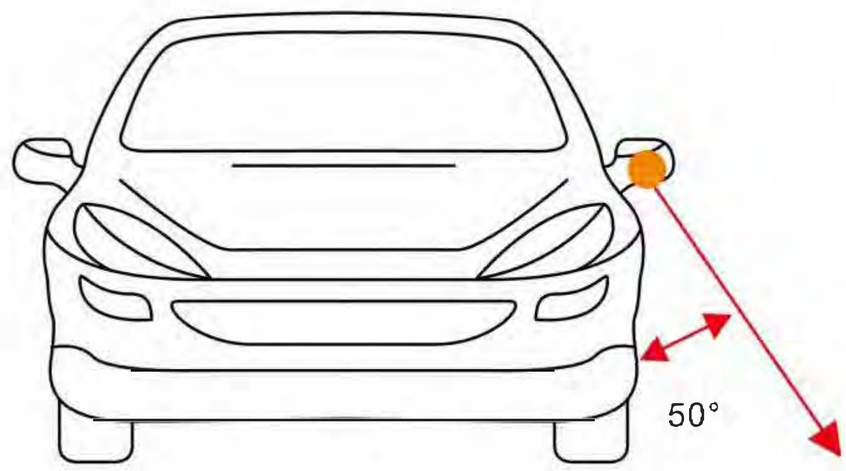
Cameras Angle Adjusting

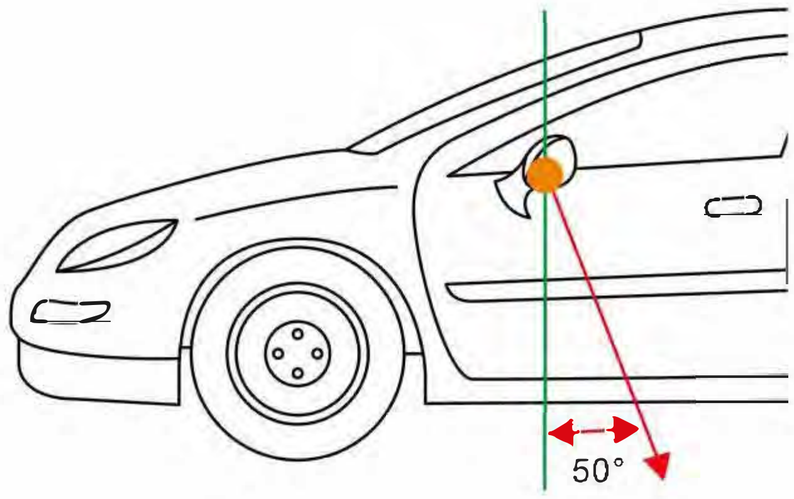
For adapting to different shape of side mirror plastic shell, the angle and direction of side cameras are always designed to be free adjusted. Rotate the side cameras according to the image to keep vehicle body in image closely to the side calibration line and meanwhile keep the pixel in wider angles and farther places can be captured as many as possible. Keep the left and right calibration point distributed in symmetrical position in the screen.

Next step, the mirroring setting of the camera sensor need to be set according to camera installation direction. The guideline for this setting is to make the pixel content of the image as same as the instruction show in the system calibration preview menu. Generally speaking, except for the rear camera, all other cameras must be original image.









Host Device Installation Steps

1. Disassemble the panel of central control unit, and connect the reversing video channel of DVD monitor or other display screen(AV in).

2. **The host control unit installation:**

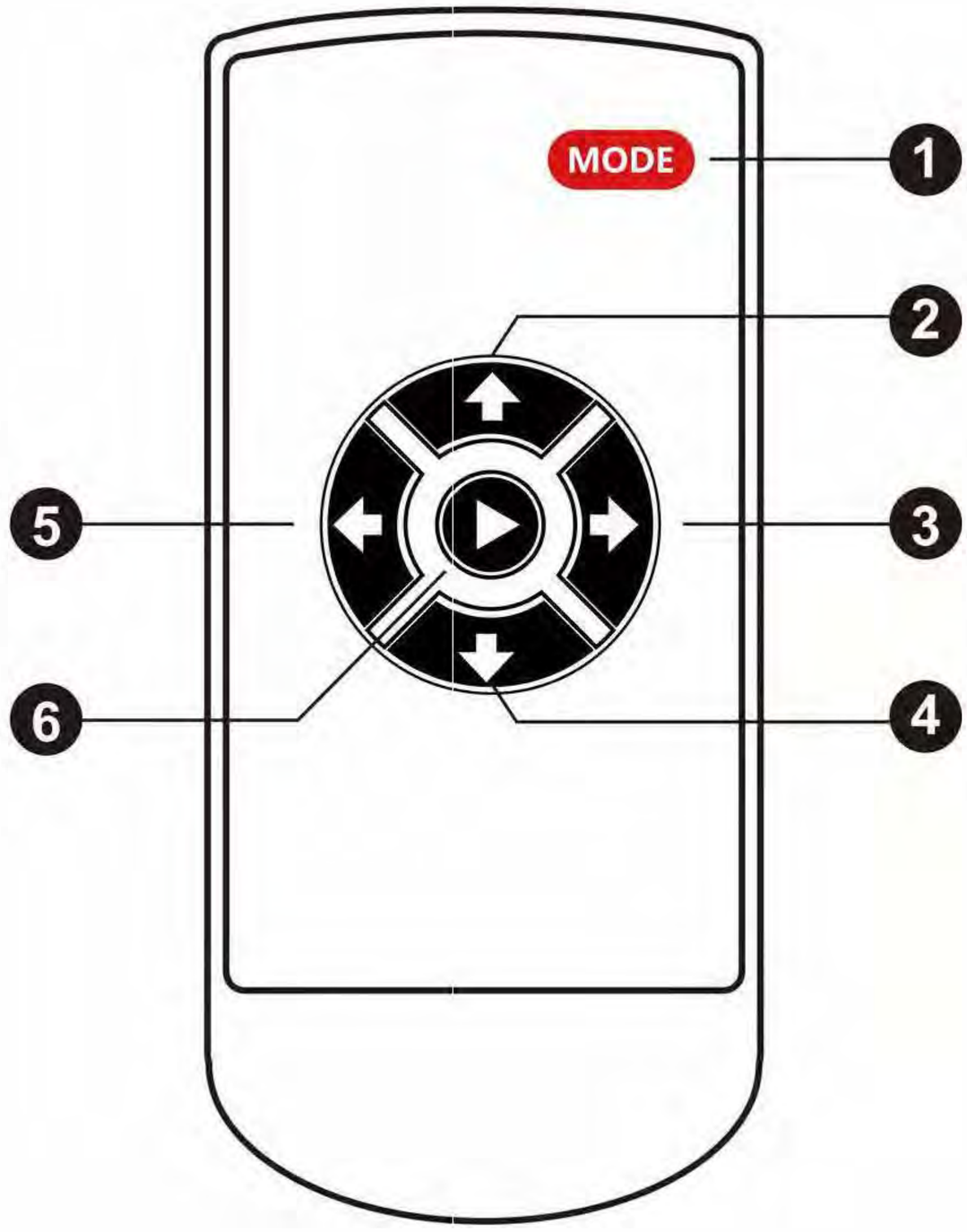
IR Mode: Put the infrared receiver in a proper position.

Rotary encoder Mode: Selecting an appropriate position of the central control panel or beside the hand grip of the vehicle to drill a hole of 3.5mm in diameter, using the screw to fix the bottom panel, and connect the cables to the tool cabinet.

3. Please connect the positive of the left/right turning signal from the fuse box to host wire harness, or from side mirror turning LED indicator to the camera side of the cable.

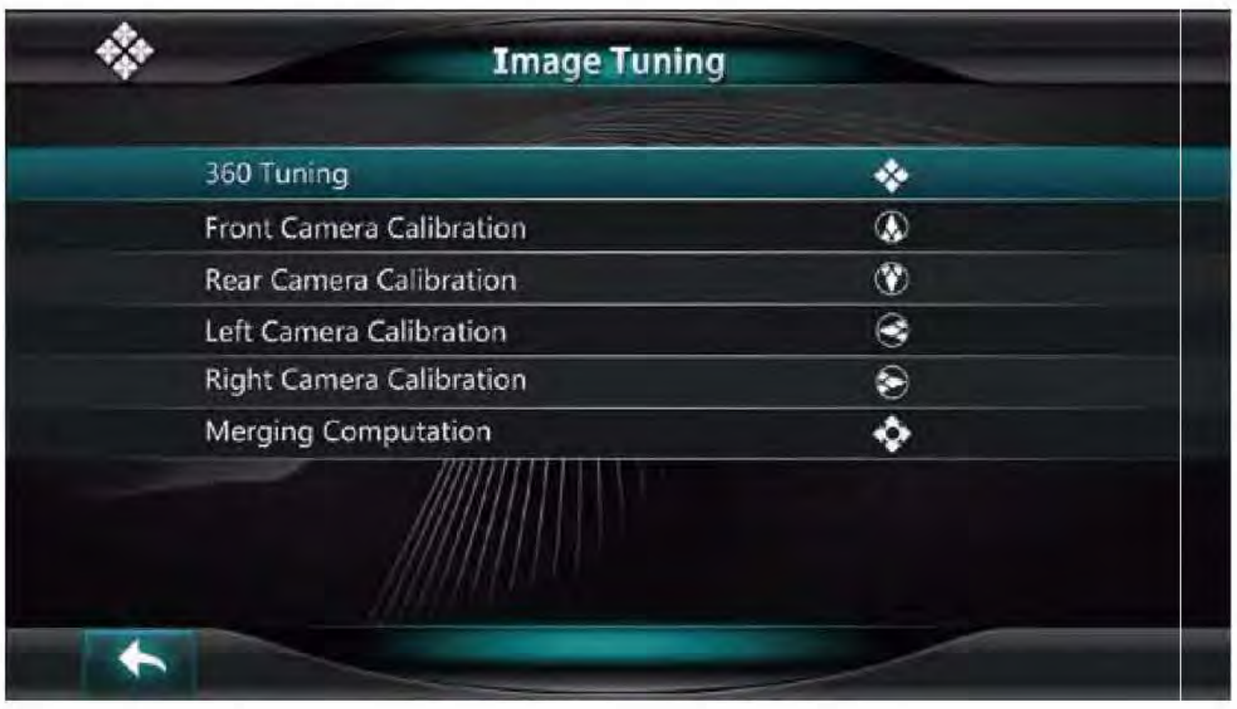
4. Fix the host device in the glove box or the space behind the central control panel, DO NOT cover the heat dissipation hole.

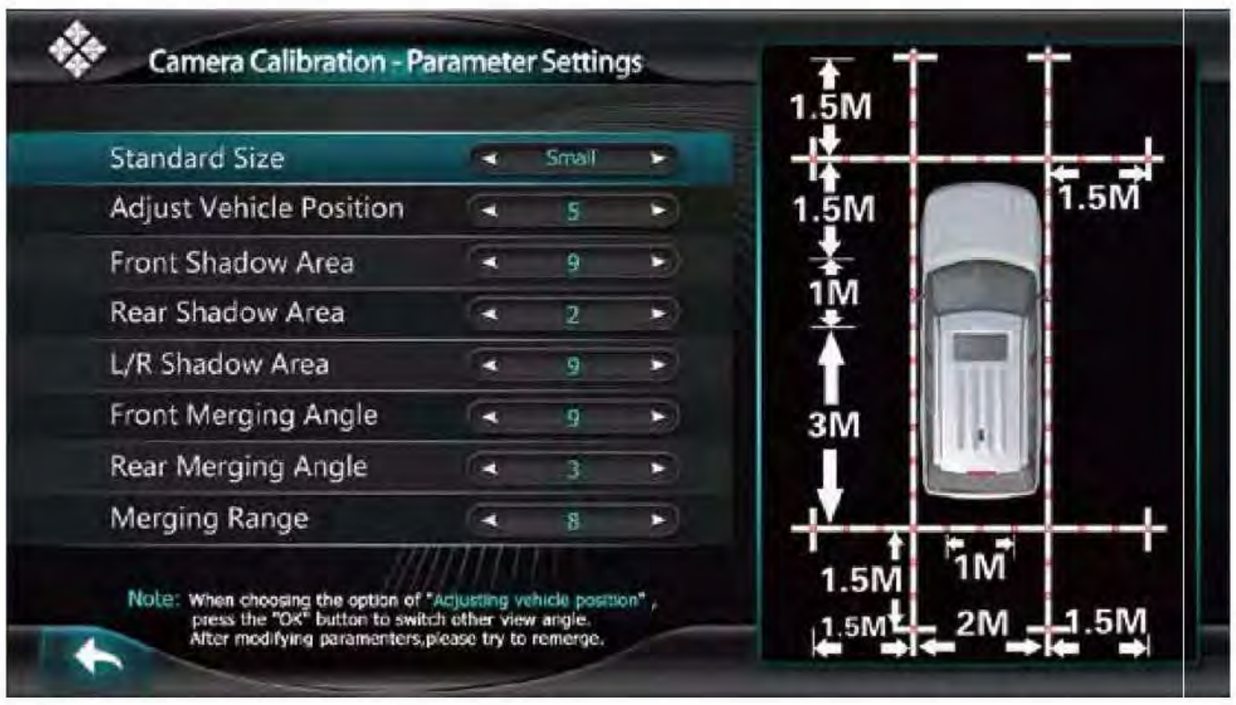
Remote Controller Introduction



Key Number	Description	Function
[1]	MODE	Enter Setting Menu
		In SVM Mode, long press 2 seonds enter into 4CH recording mode
[2]	UP	In Menu menu, select last menu option
		In SVM Mode, short press enter high beam mode, press again back to SVM mode
[3]	RIGHT	In SVM model, long press enter into right 360 rotatable mode
[4]	DOWN	In SVM mode, long press enter into reversing gear mode
		In menu setting, select next menu option
[5]	LEFT	In SVM model, long press enter into 360 rotateable mode
[6]	Confirm	Confirm selected option

Calibration Parameters Setting

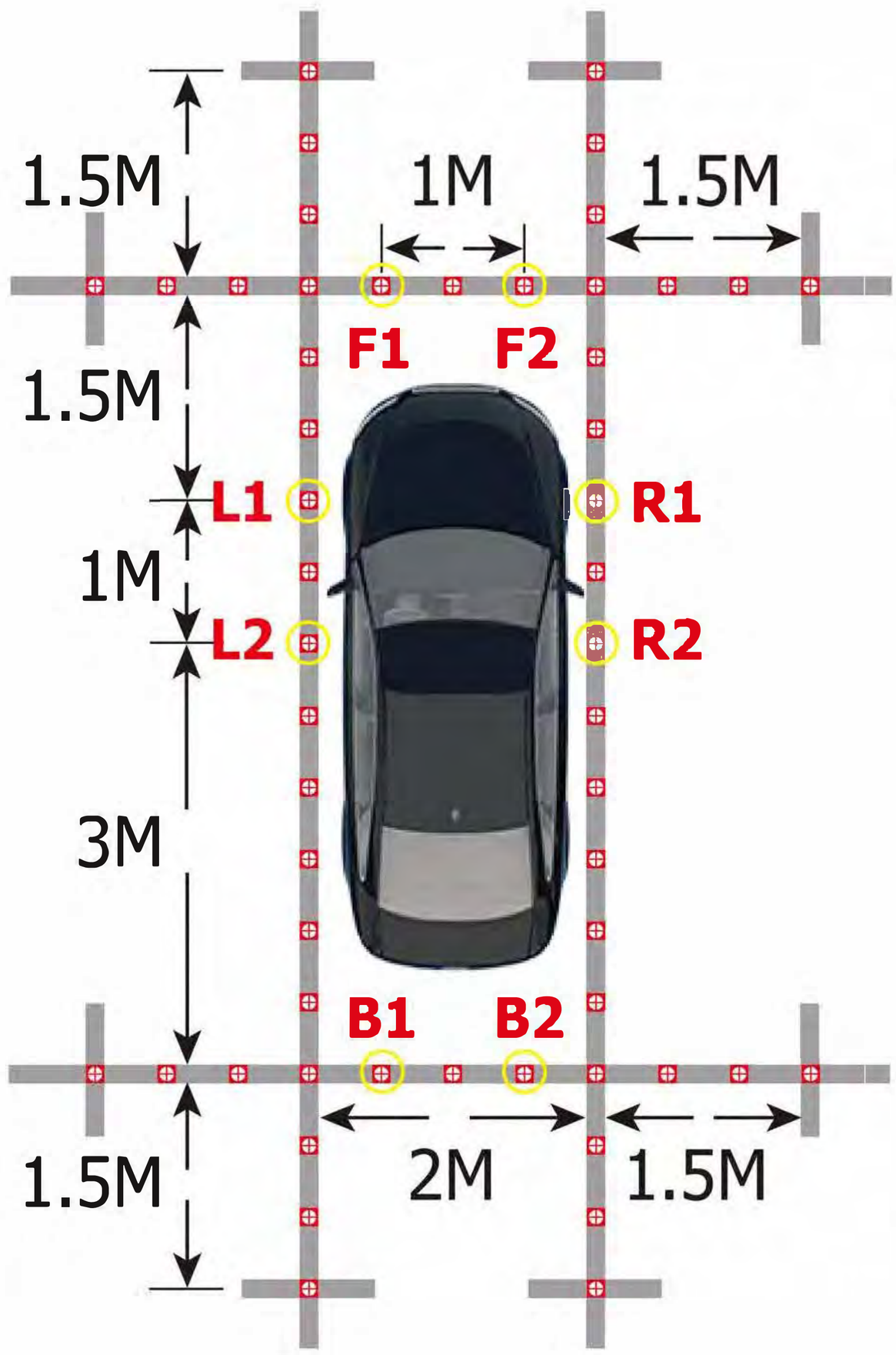




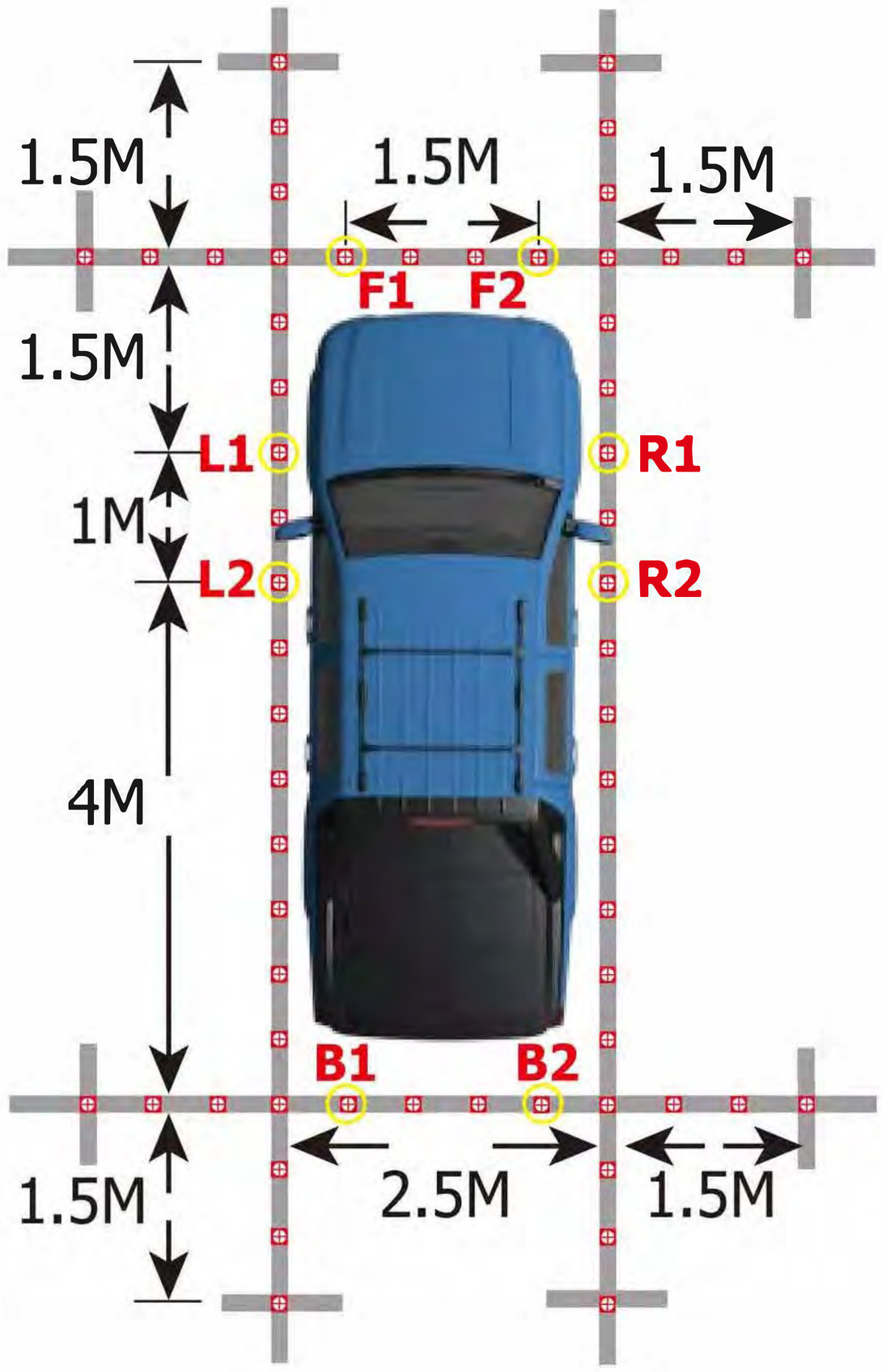
First of all, please press the "MODE" button on the remote controller in a short time to enter system menu, the default passwords is “360”, then press the “OK” button to Image Calibration Menu.

Second, please select the correct calibration size for the applied vehicle model, set the shadow area and each step of the shadow setting is 5cm, then select the camera sensor type, please keep it as the default if you are not sure with the sensor type.

Calibration Tape Position



Light-Duty Vehicle



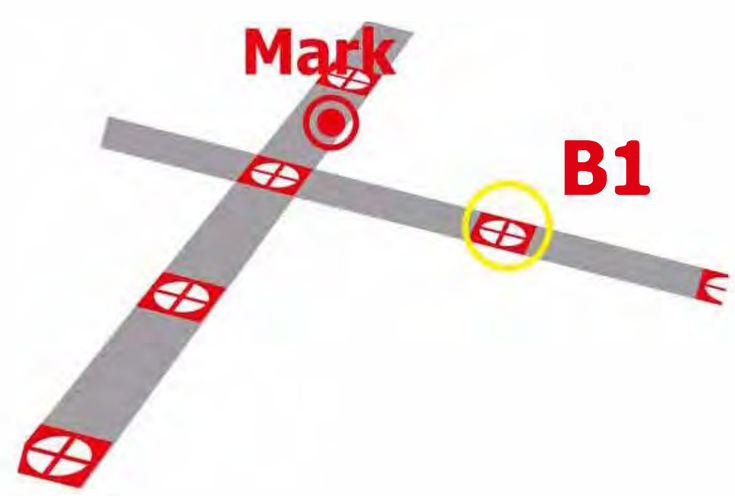
Medium-Duty Vehicle

⚠ TIP ⚠

- As the menu diagram shows, pasting the calibration tape around the vehicle.
- Please refer to the calibration pictures of different vehicle models and sizes to select the correct one for matching your vehicle.

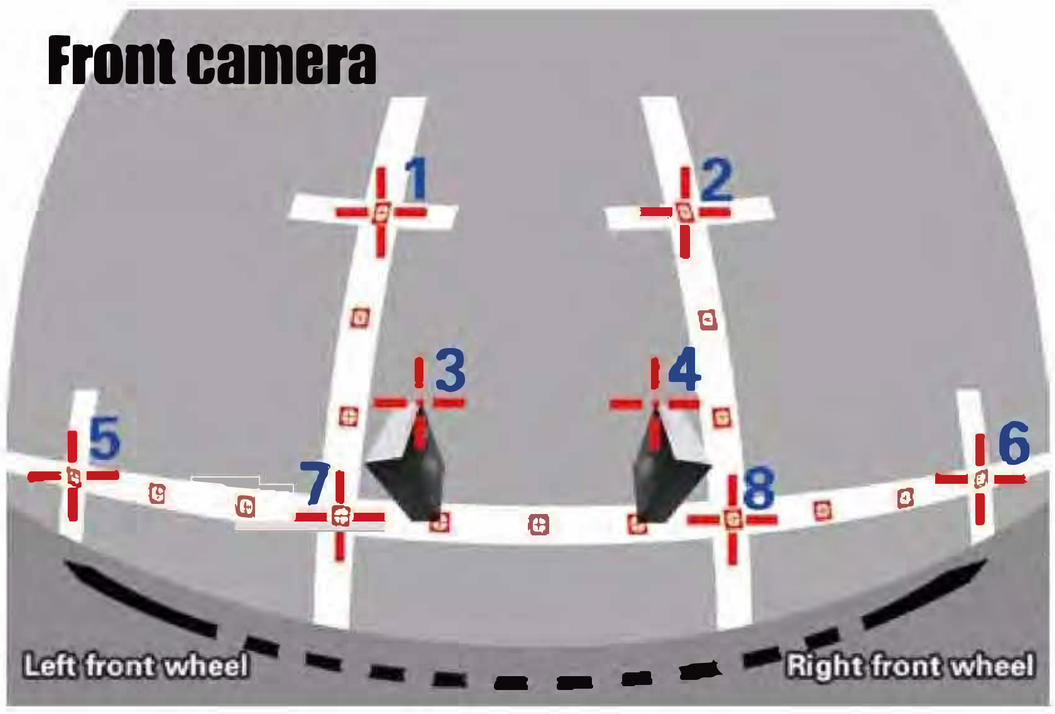
Calibration Tape Position

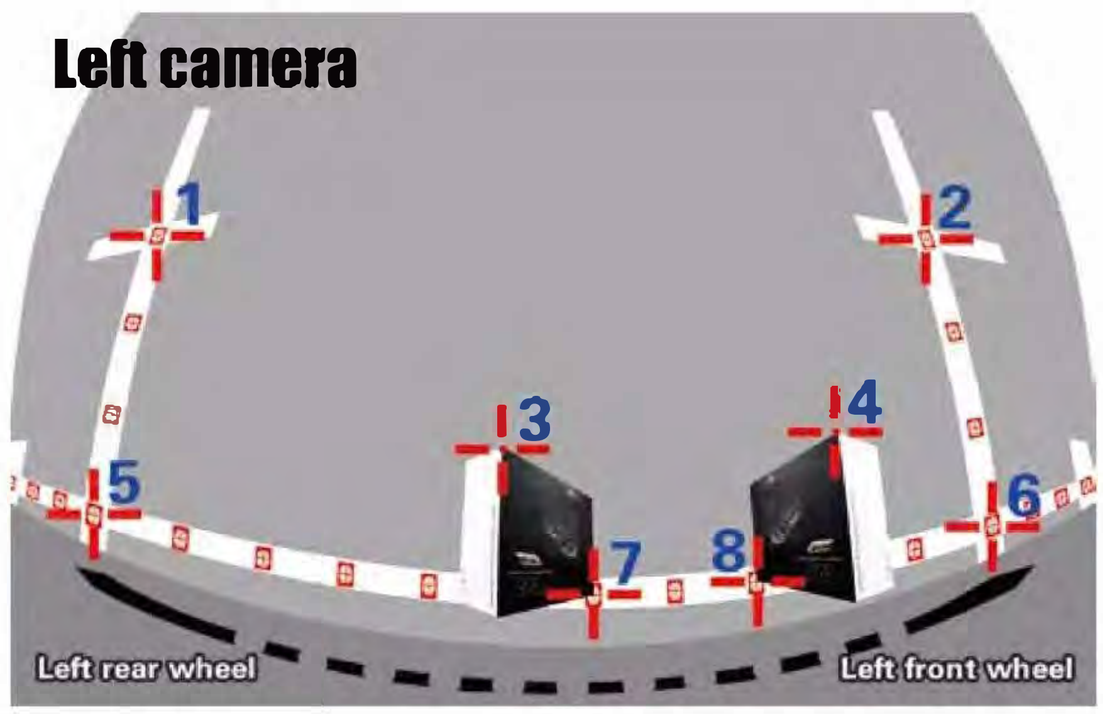
Heavy-Duty Vehicle



Calibration Points Marking

You can start calibrating the four cameras one by one when the cursor is twinkling. Moving the cursor to the corresponding locations by the remote controller buttons of up/down/left/right, then press the “ok” button to mark the current calibration point in the screen and then the system menu will guide you to the next calibration pixel point in order from 1 to 8 one by one, please see the correct location and sequence of the calibration points as below pictures:





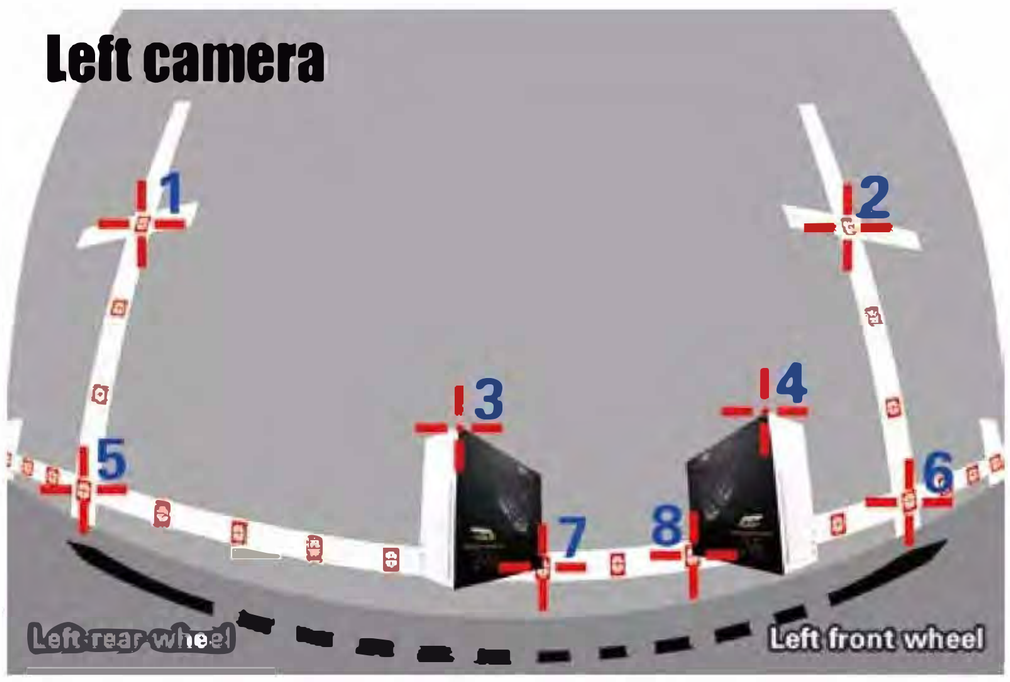
Press the red “Mode” button to toggle to previous calibration point selection when needed.

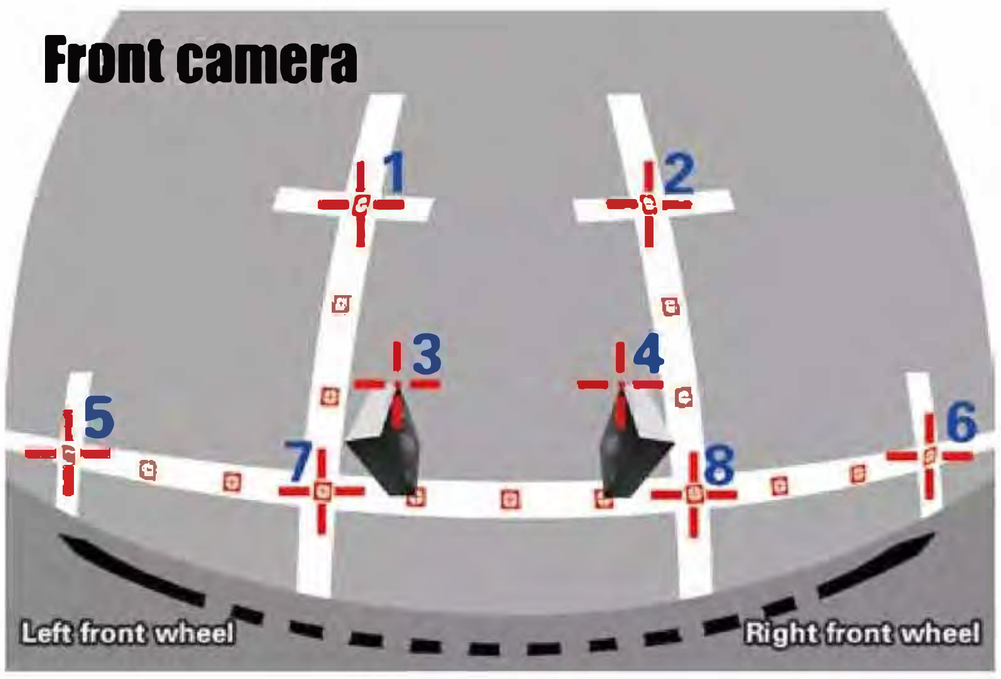
⚠ TIP ⚠

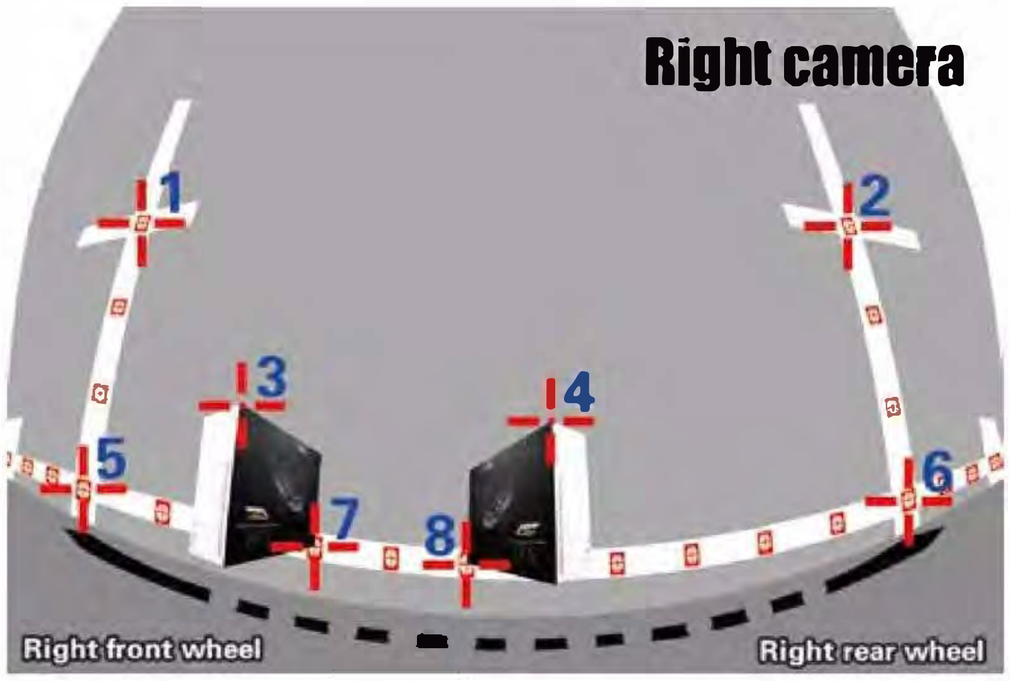
The calibration locations of No.7 calibration pixel point and No.8 calibration pixel point between the front&rear cameras and the sides cameras are totally different. The more accurate calibration points you mark, the better quality of the panoramic image merging will be.

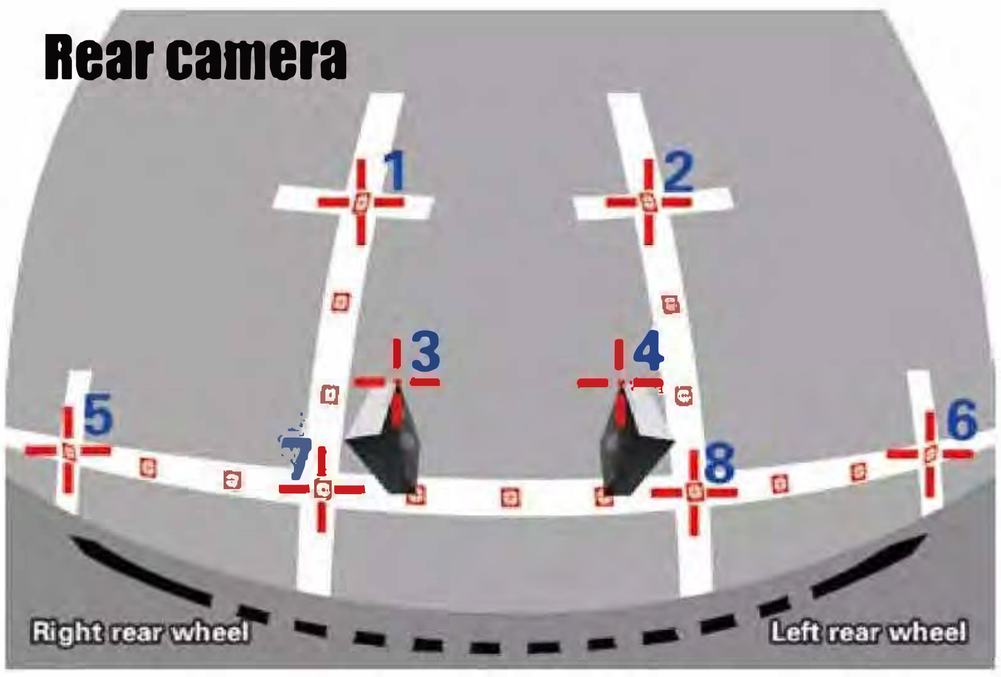
Placing Packing Box

There are always 8 calibration points for each camera which need to be marked in the screen, the third pixel point and forth calibration point are always special points which are actually the diagonal corner of the packing box. The SVM packing boxes can be divided into outer and inner one so that each packing box can be used for calibration 1 camera each time.







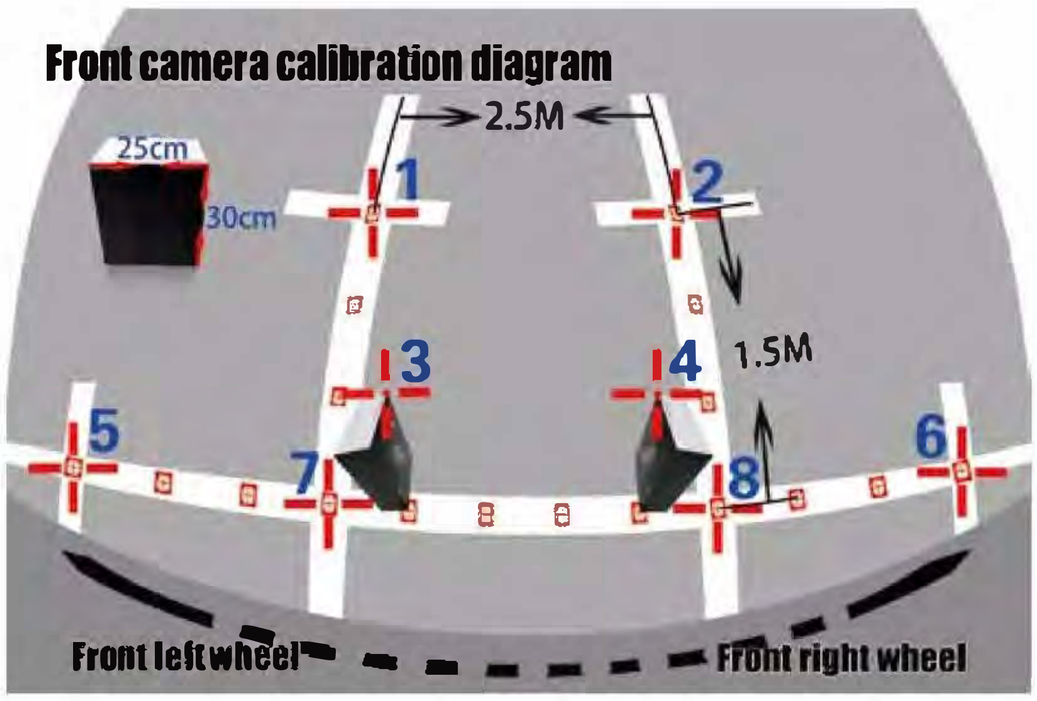


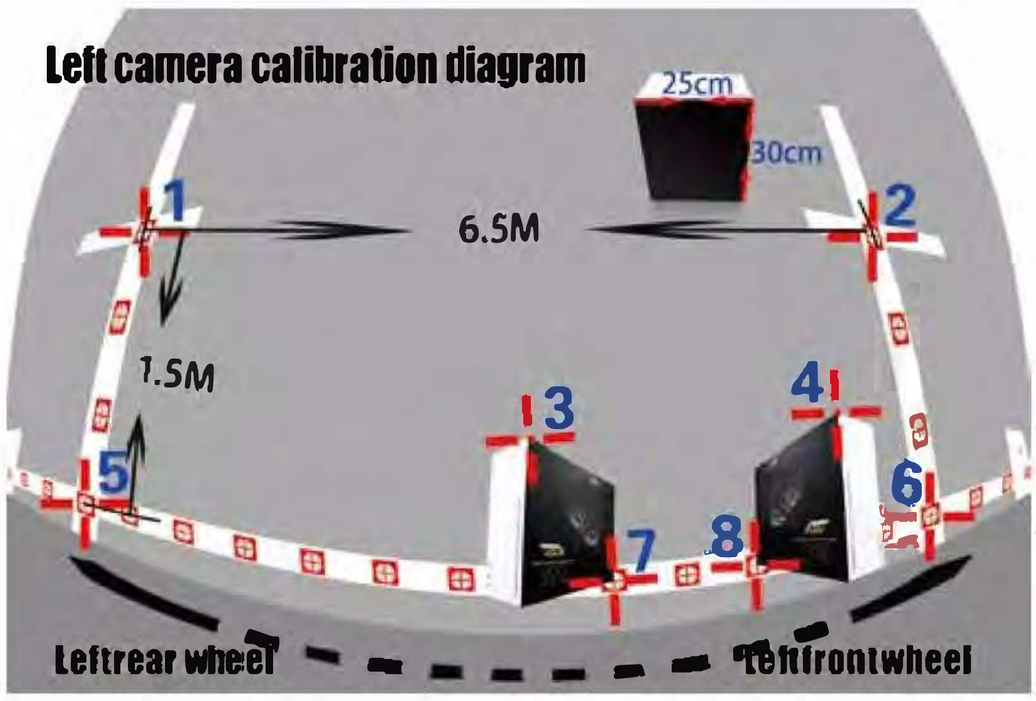
⚠ TIP ⚠

Put the 2 packing boxes (Outer and Inner) in the correct position separately as the pictures above illustrated. You can also use other boxes instead as a calibration reference objects, the dimension requirements of the box must be 30cm in height and 25cm in width.

Calibration Points Marking

You can start calibrating the four cameras one by one when the cursor is twinkling. Moving the cursor to the corresponding locations by the remote controller buttons of up/down/left/right, then press the “ok” button to mark the current calibration point in the screen and then the system menu will guide you to the next calibration pixel point in order from 1 to 8 one by one, please see the correct location and sequence of the calibration points as below pictures:





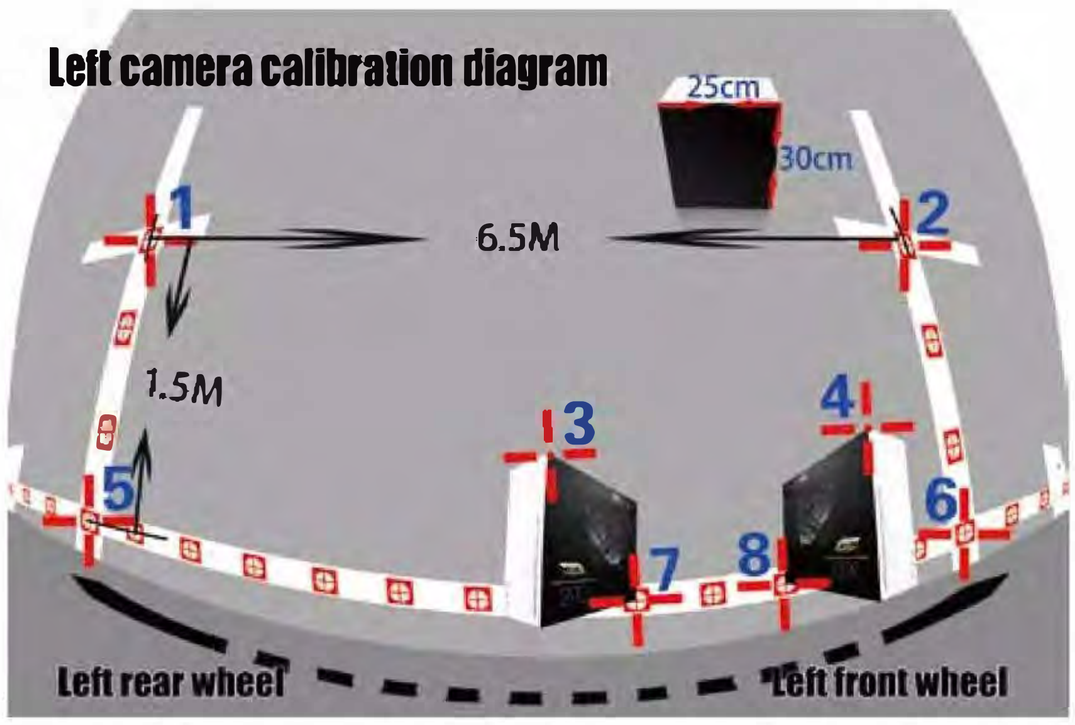
Press the red “Mode” button to toggle to previous calibration point selection when needed.

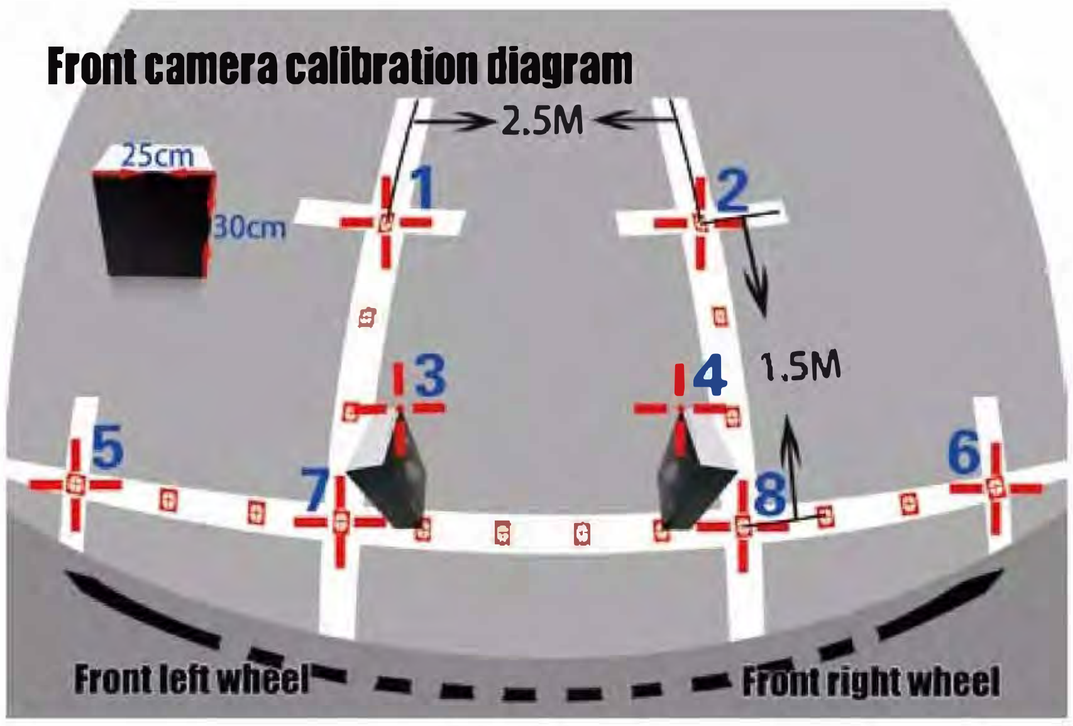
⚠ TIP ⚠

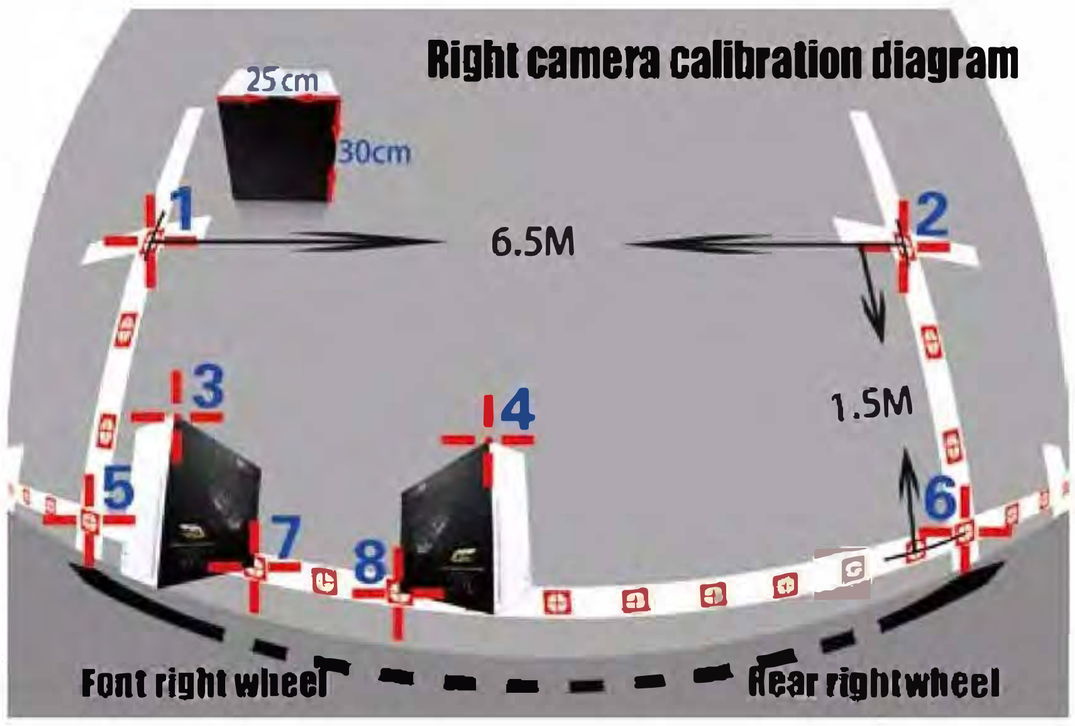
The calibration locations of No.7 calibration pixel point and No.8 calibration pixel point between the front&rear cameras and the sides cameras are totally different. The more accurate calibration points you mark, the better quality of the panoramic image merging will be.

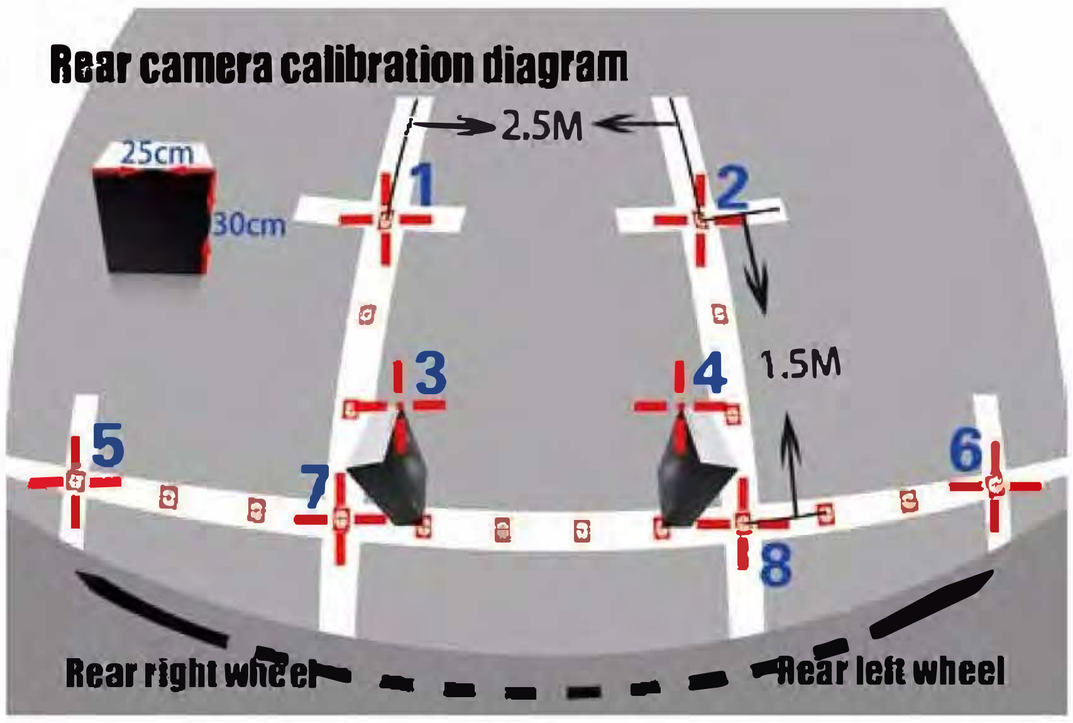
Placing Packing Box

There are always 8 calibration points for each camera which need to be marked in the screen, the third pixel point and forth calibration point are always special points which are actually the diagonal corner of the packing box. The SVM packing boxes can be divided into outer and inner one so that each packing box can be used for calibration 1 camera each time.







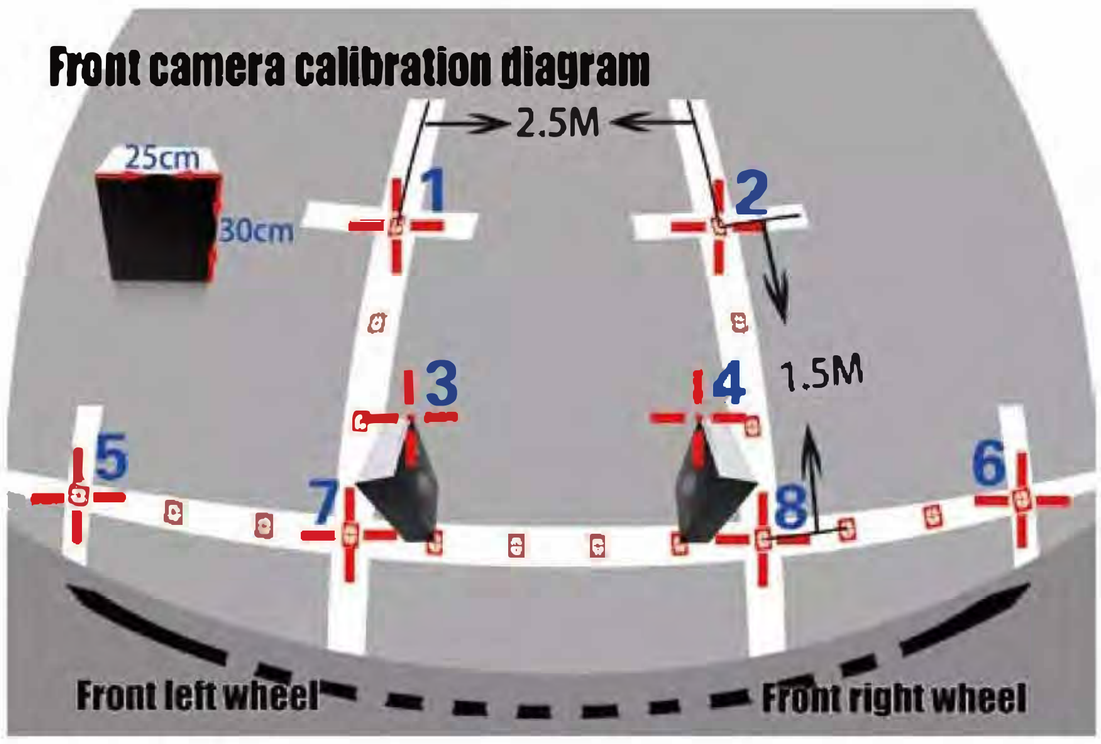


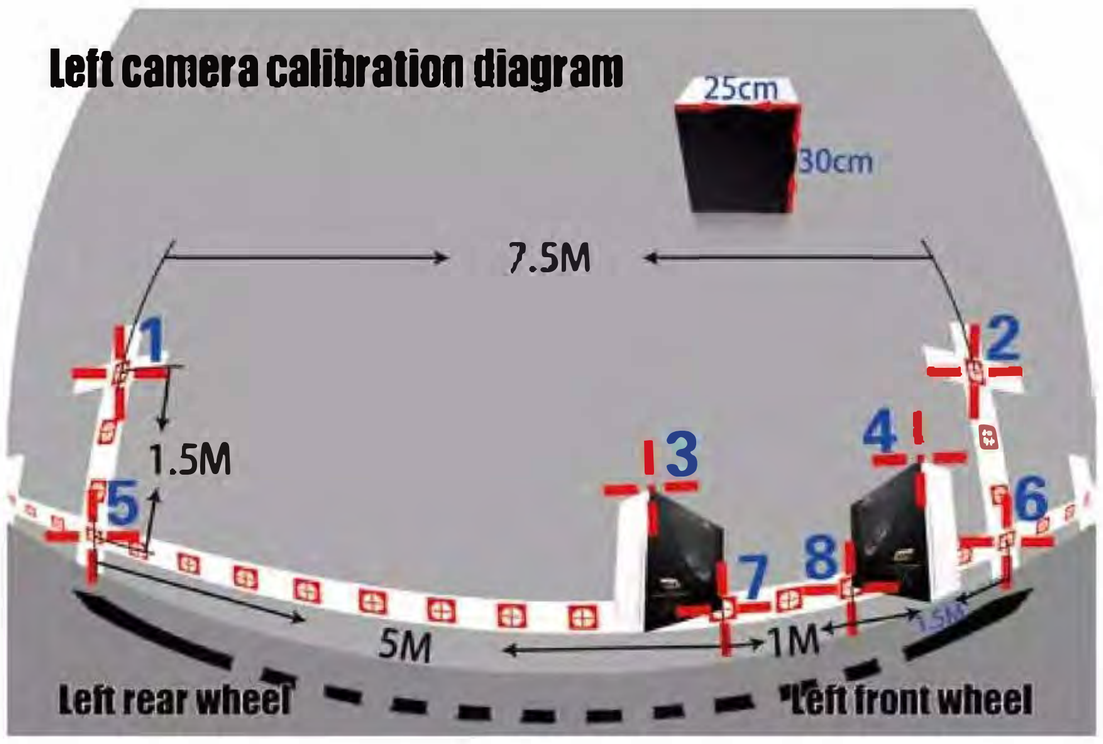
⚠ TIP ⚠

Put the 2 packing boxes (Outer and Inner) in the correct position separately as the pictures above illustrated. You can also use other boxes instead as a calibration reference objects, the dimension requirements of the box must be 30cm in height and 25cm in width.

Calibration Points Marking

You can start calibrating the four cameras one by one when the cursor is twinkling. Moving the cursor to the corresponding locations by the remote controller buttons of up/down/left/right, then press the “ok” button to mark the current calibration point in the screen and then the system menu will guide you to the next calibration pixel point in order from 1 to 8 one by one, please see the correct location and sequence of the calibration points as below pictures:





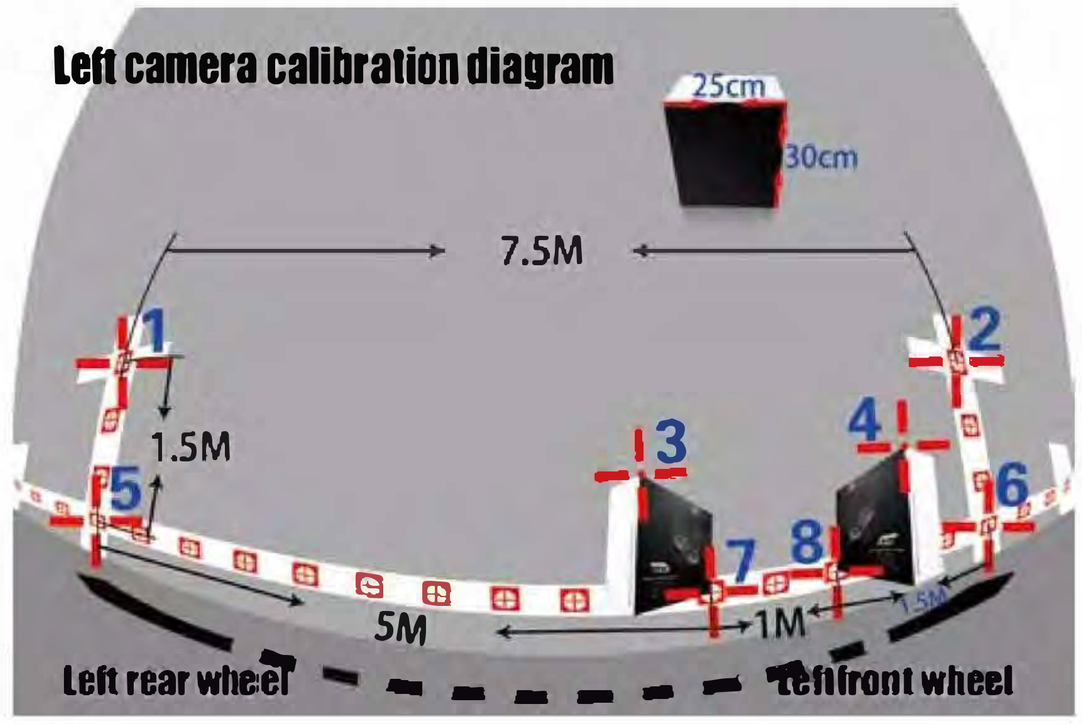
Press the red “Mode” button to toggle to previous calibration point selection when needed.

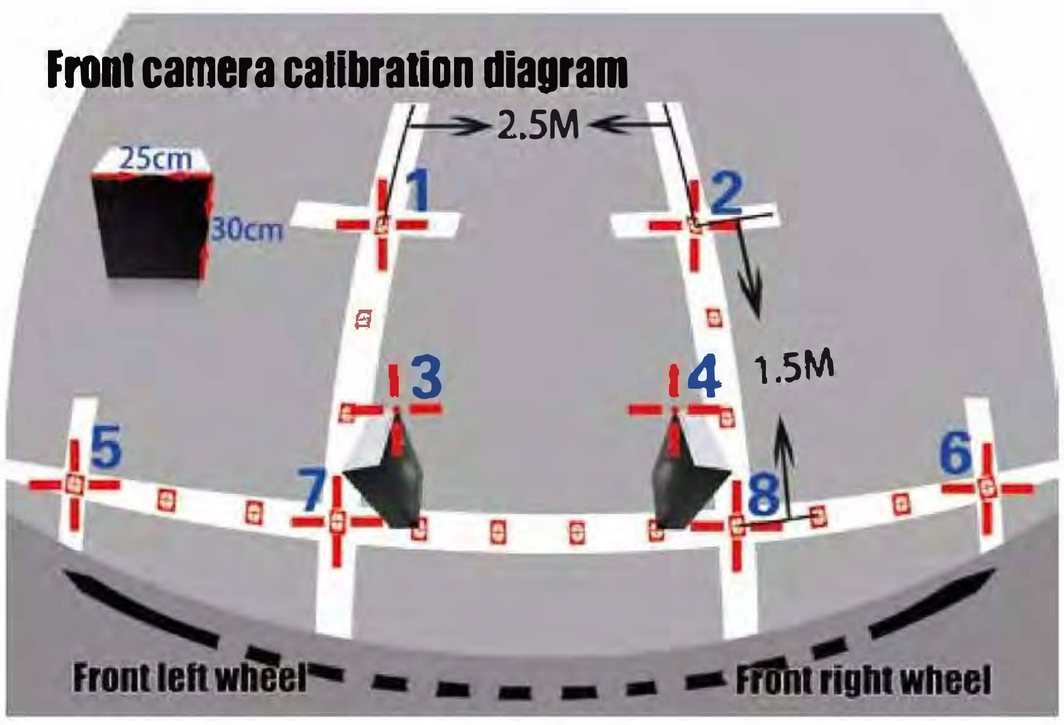
⚠ TIP ⚠

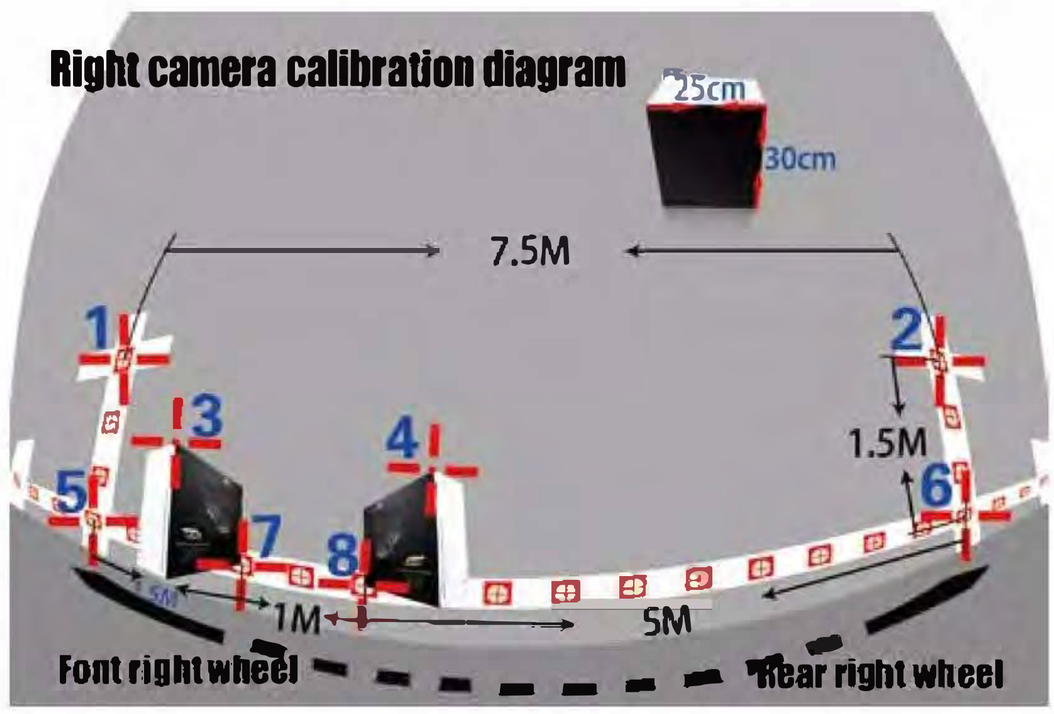
The calibration locations of No.7 calibration pixel point and No.8 calibration pixel point between the front&rear cameras and the sides cameras are totally different. The more accurate calibration points you mark, the better quality of the panoramic image merging will be.

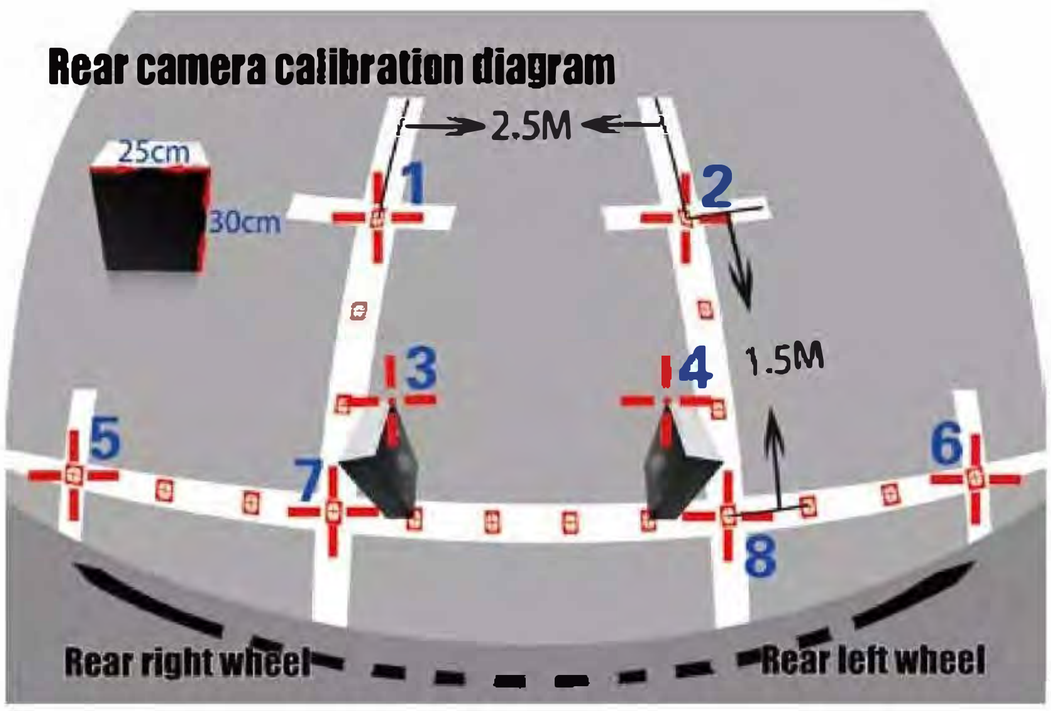
Placing Packing Box

There are always 8 calibration points for each camera which need to be marked in the screen, the third pixel point and forth calibration point are always special points which are actually the diagonal corner of the packing box. The SVM packing boxes can be divided into outer and inner one so that each packing box can be used for calibration 1 camera each time.





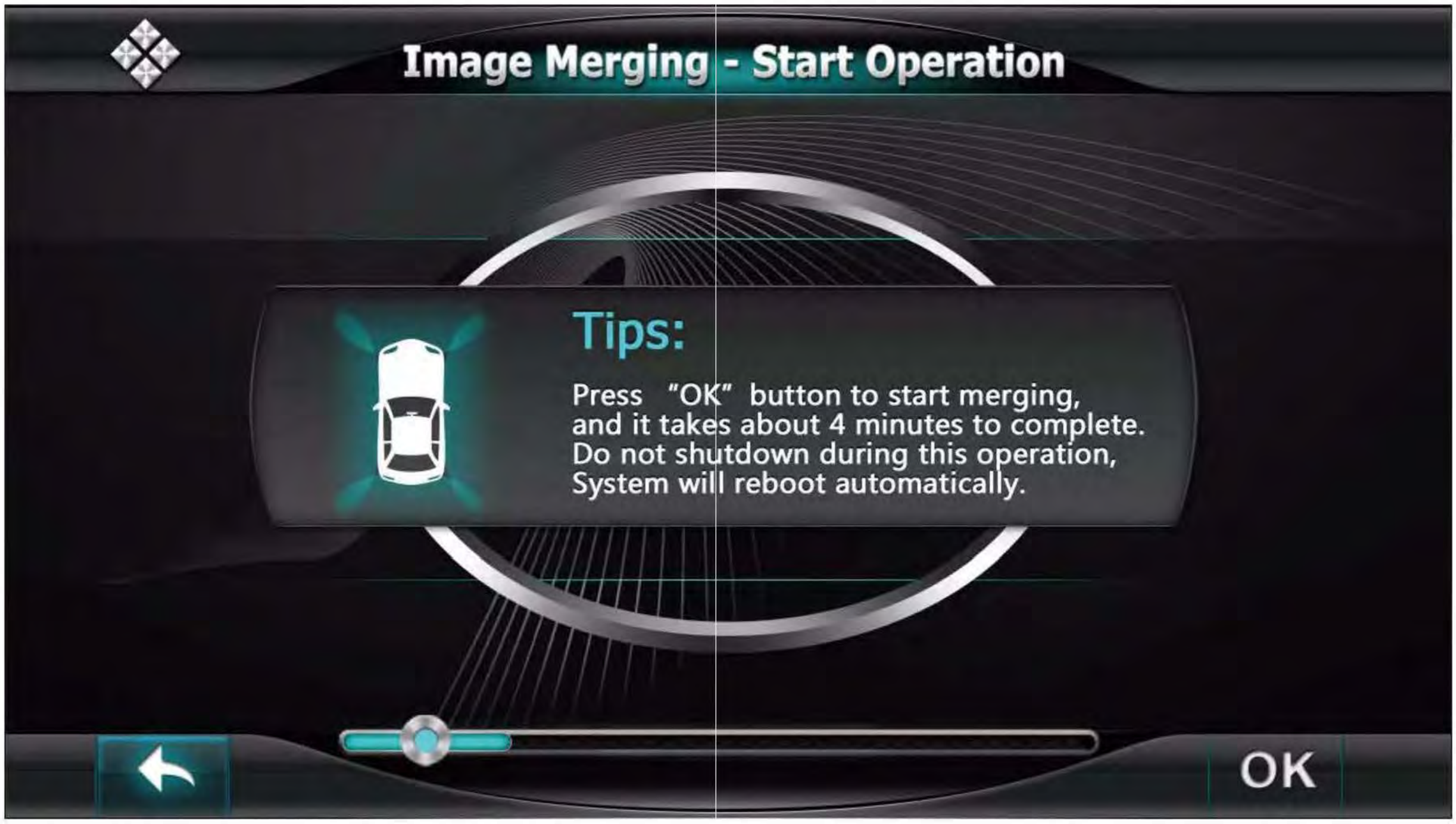




⚠ TIP ⚠

Put the 2 packing boxes (Outer and Inner) in the correct position separately as the pictures above illustrated. You can also use other boxes instead as a calibration reference objects, the dimension requirements of the box must be 30cm in height and 25cm in width.

Image Calculation



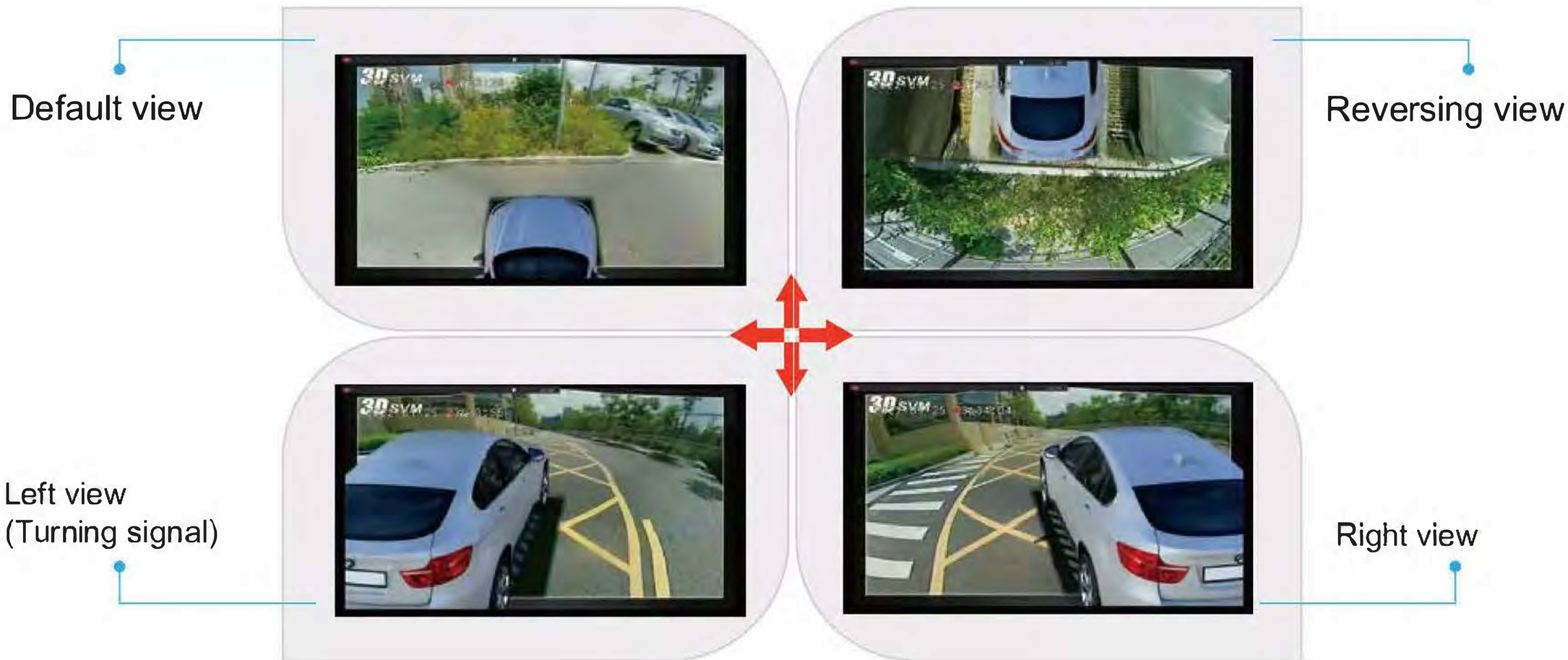
Press “OK” to go ahead.

Please do not shut down during this operation,

System will reboot automatically.

Visual angles Distributing Modes

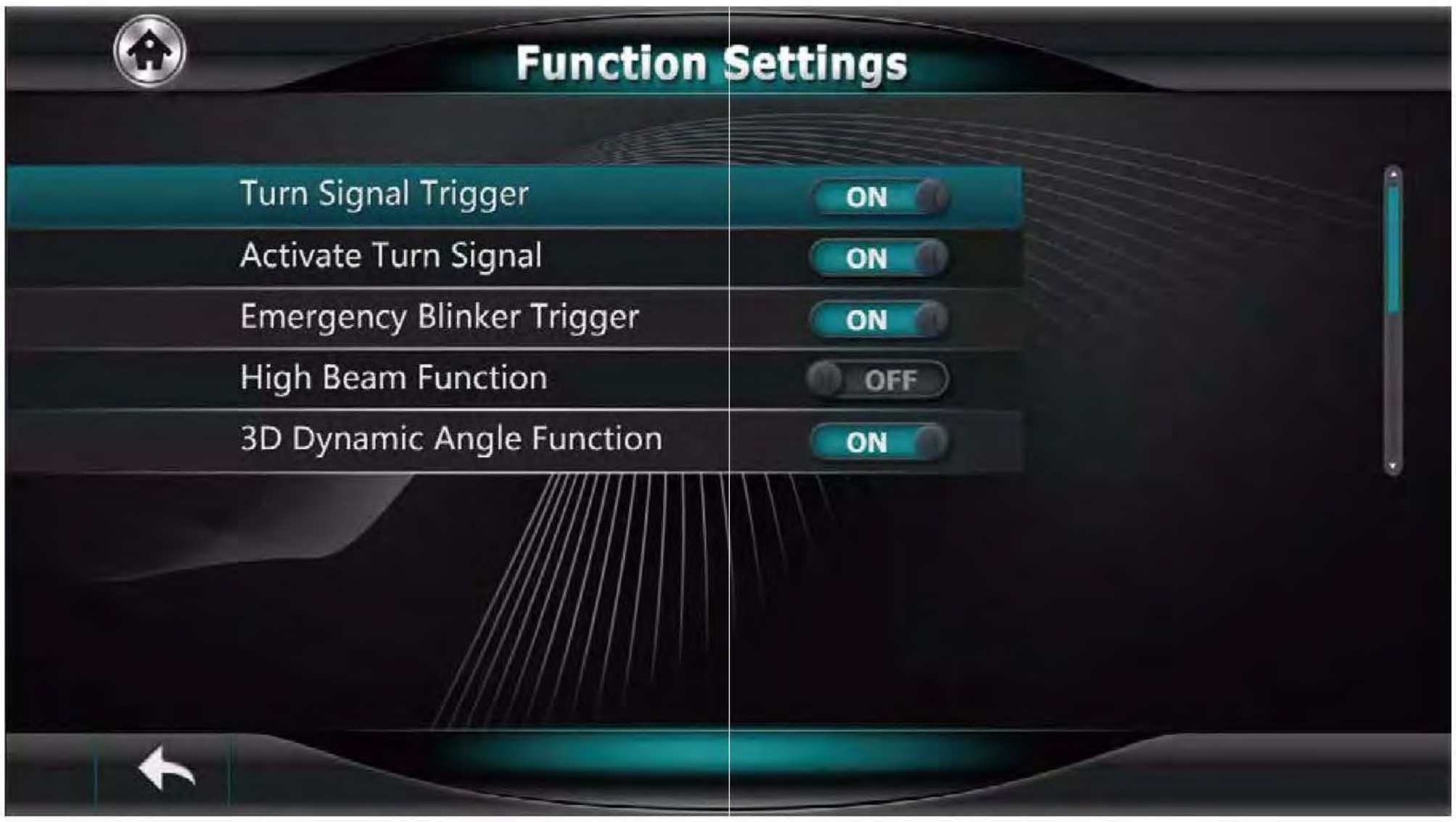
Full Screen



Split Screen

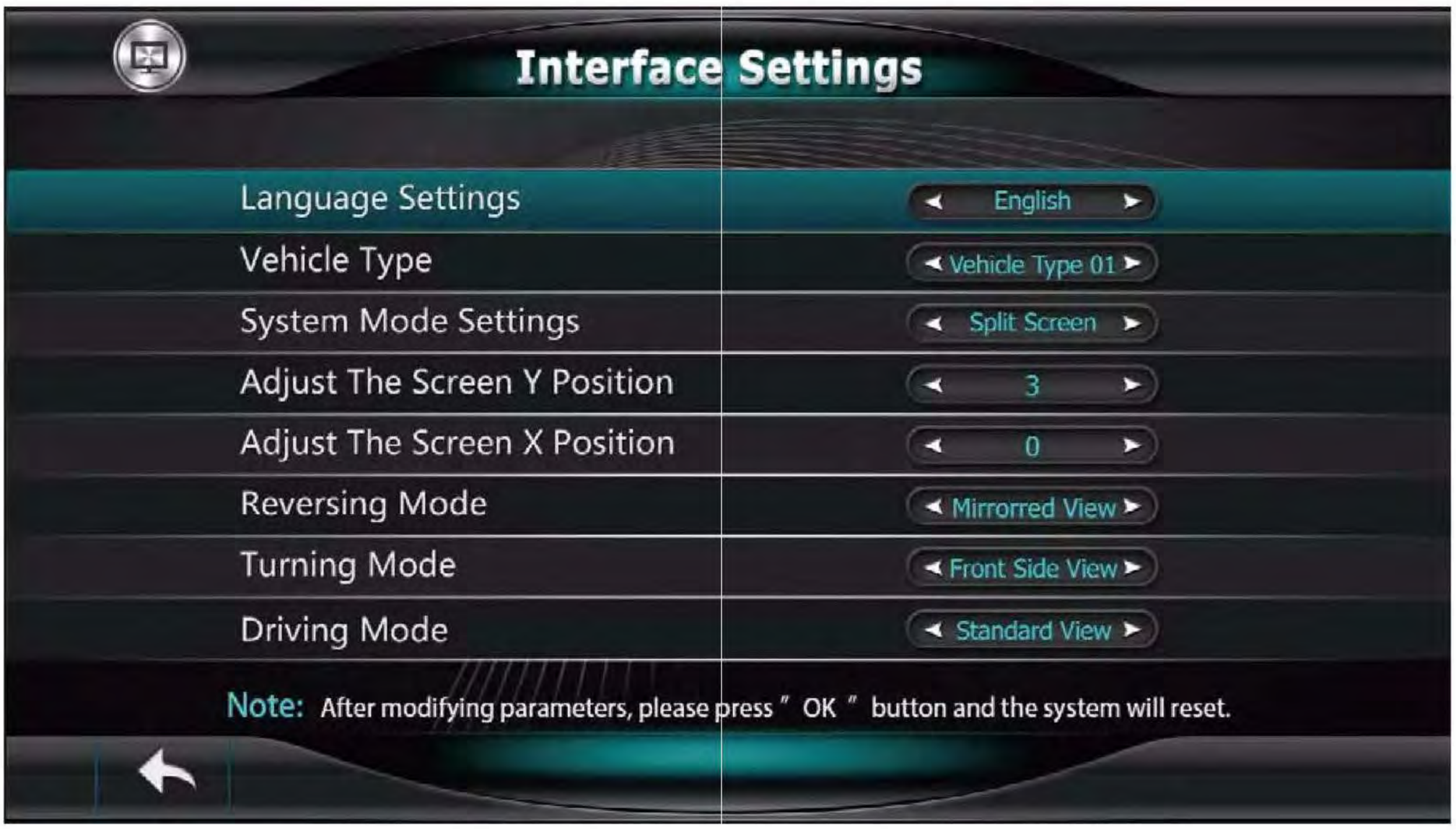
Menu → User Settings → Window Configuration

Parameters Setting and Menu Description

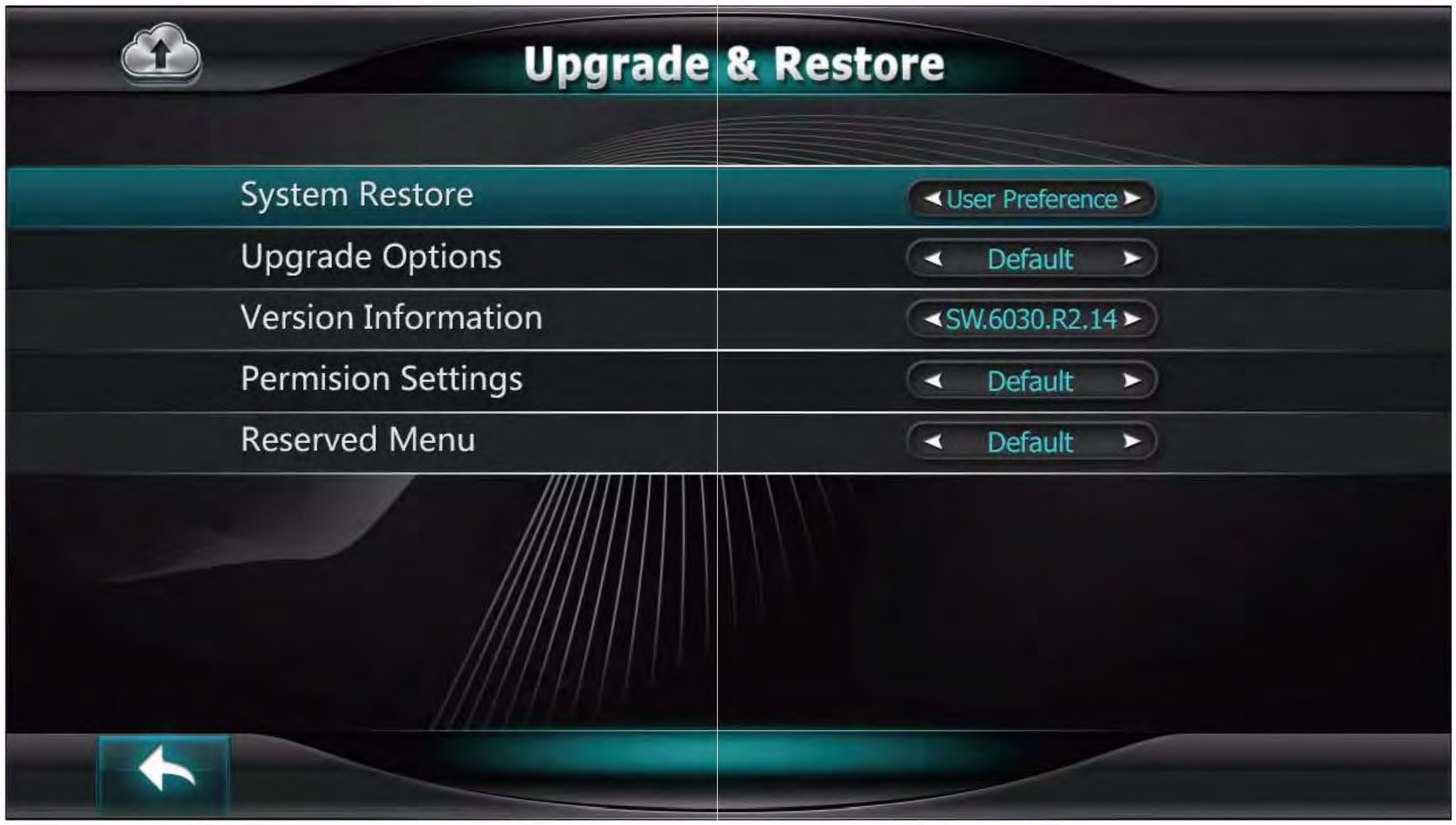


Menu Item	List Options	Description
Turn Signal Wakeup	ON / OFF	Turning Signal is optional after engine is fired, this option is a global switch for left and right turning indicator, when this option is set to ON, when the turning event is triggered, the SVM system will response to this event, and vice, versa.
Activate Turn Signal	ON / OFF	When the SVM is going to standby mode, this option is use to control whether the SVM system can be activated through turning signals.
Emergency Blinker Wakeup	ON / OFF	When the SVM is going to standby mode, this option is use to control whether the SVM system can be activated from Emergency Blinker, and you can also use Emergency Blinker to set it back to standby mode again when this option is set to ON.
High Beam Function	ON / OFF	Just like the turning signal, high beam signal is useful to toggle the free-eye point and change the view angle for surround safety.
3D Dynamic Angle Function	ON / OFF	3D Dynamic Angle,mears the view angle will directly switch to next one without any motion carve.

User Settings

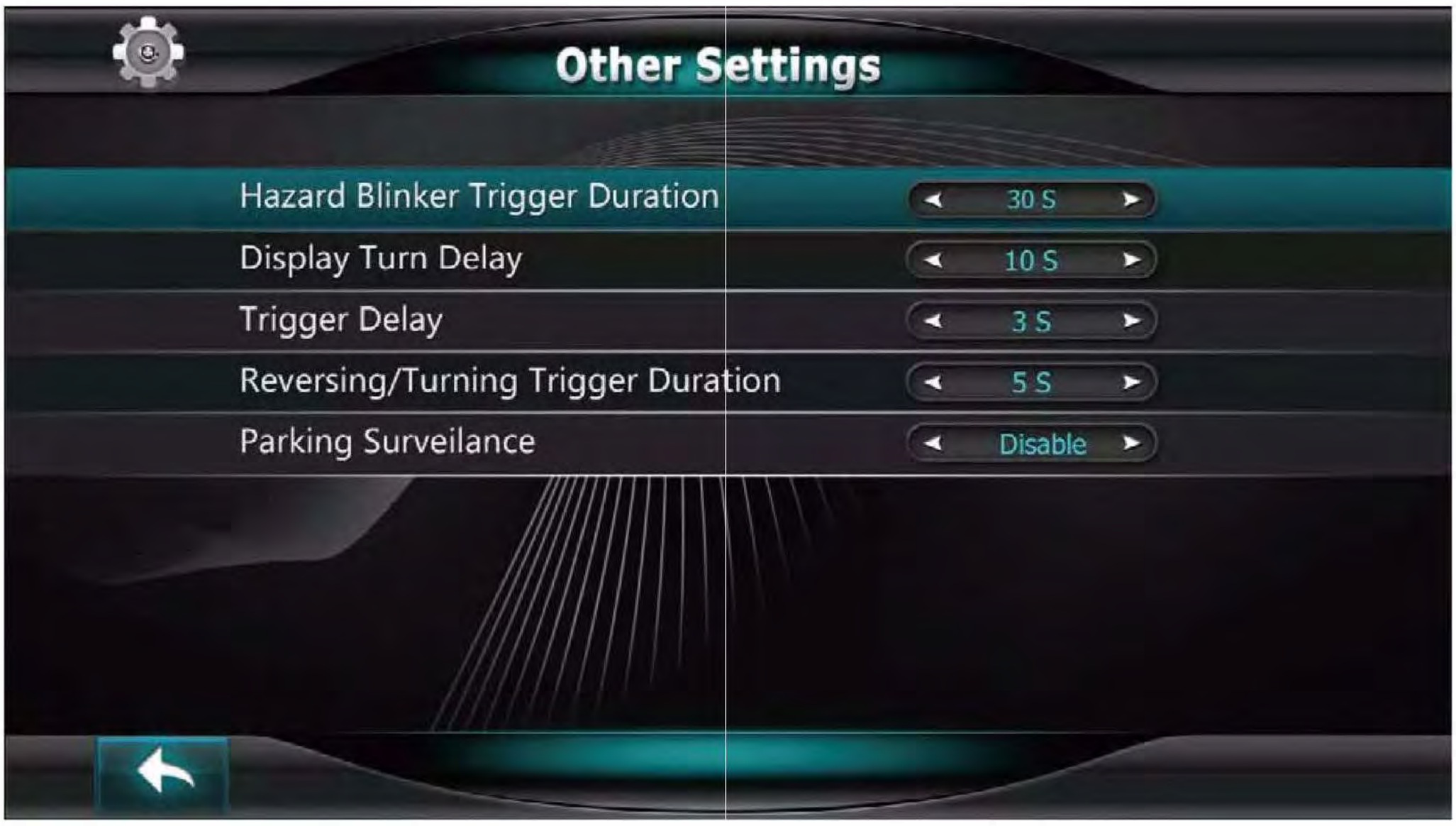


Menu Item	List Options	Description
Language Settings	English/ Simplified Chinese	
Vehicle Type	Vehicle Type 1..... Vehicle Type 5	
System Mode Settings	Split Screen	
Adjust The Screen Y Position	-9 ~ +9 Pixel	Screen TCON horizontal front porch and back porch control.
Adjust The Screen X Position	-9 ~ +9 Pixel	Screen TCON vertical front porch and back porch control.
Reversing Mode	Standard View / Original Image / Mirrorred View	Please refer to the AVM signal diagram
Turning Mode	Front Side View / Speeial View / Rear Side View	Please refer to the AVM signal diagram
Driving Mode	Stardard View / Wide Angle / Original Image	Please refer to the AVM signal diagram

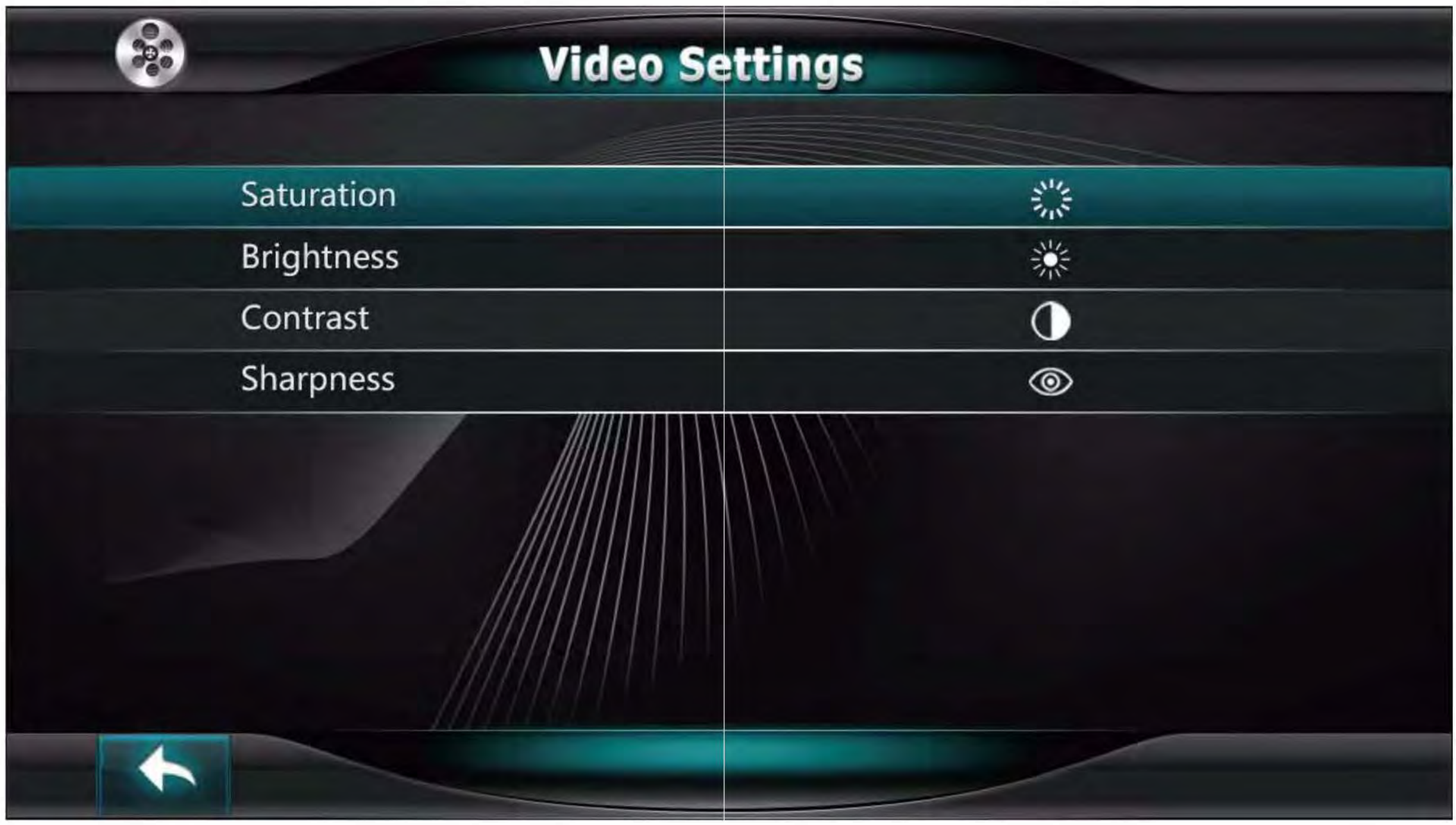


Menu Item	List Options	Description
System Restore	Default/ User Preference	Default is not functional at this moments, and choose user preference to restore user preference of video settings/window configurations etc.
Upgrade Options	Default/ Upgrade 3D Mode/ Upgrade All Export Calibration Data Import Calibration Data	Default is not functional at this moments, and choose firmware when you are about to update the firmware for the core board and choose Car 3D Model if you are about to change another Car Model for better match with the car brand.
Version Information	HW.6030.R3.25 SW.6030.R3.42 FW.6030.R2.12	
Permission Setting	Default	
Reserved Menu	Default	

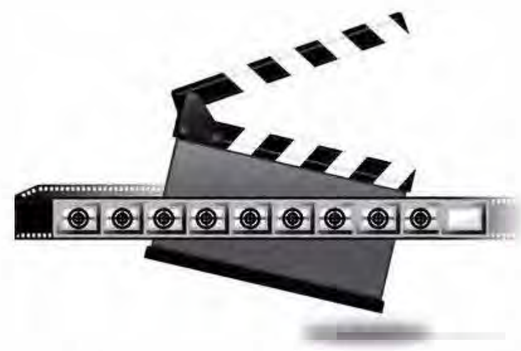
User Settings



Menu Item	List Options	Description
Hazard Blinker Trigger Duration	30S/1Min/ 3Min/5Min/ Intinity	Since the system can be activated through external Emergency Blinker, you can also set the duration time, but do remember to turn ON the Emergency Blinker Activation function first in Function Settings Menu.
Display Turn Delay	0S/10S/15S/30S Infinity	Since some specific DVD model will have a problem with AV-IN signal is coming at the early phase during system boot. Please set this option to 10s~15s if this kind of DVD you are using have such problem.
Trigger Delay	0S/3S/5S/ 10S/30S	Screen saver mode after turnning/reversing trigger
Revering/Turning Trigger Duration	0S/3S/5S	This option is similar as Emergency Blinker Wakeup Duration, you can adjust the duration time for Turning/Reversing signal here also.
Parking Surveilance	Disable	Parking Monitoring will be activated after 3 minutes when ACC is off



Menu Item	List Options	Description
Saturation	-9 ~ +9	Adjust input video saturation
Brightness	-9 ~ +9	Adjust input video brightness
Contrast	-9 ~ +9	Adjust input video contrast
Sharpness	-7 ~ +8	Adjust input video sharpness



Video Recording Functions

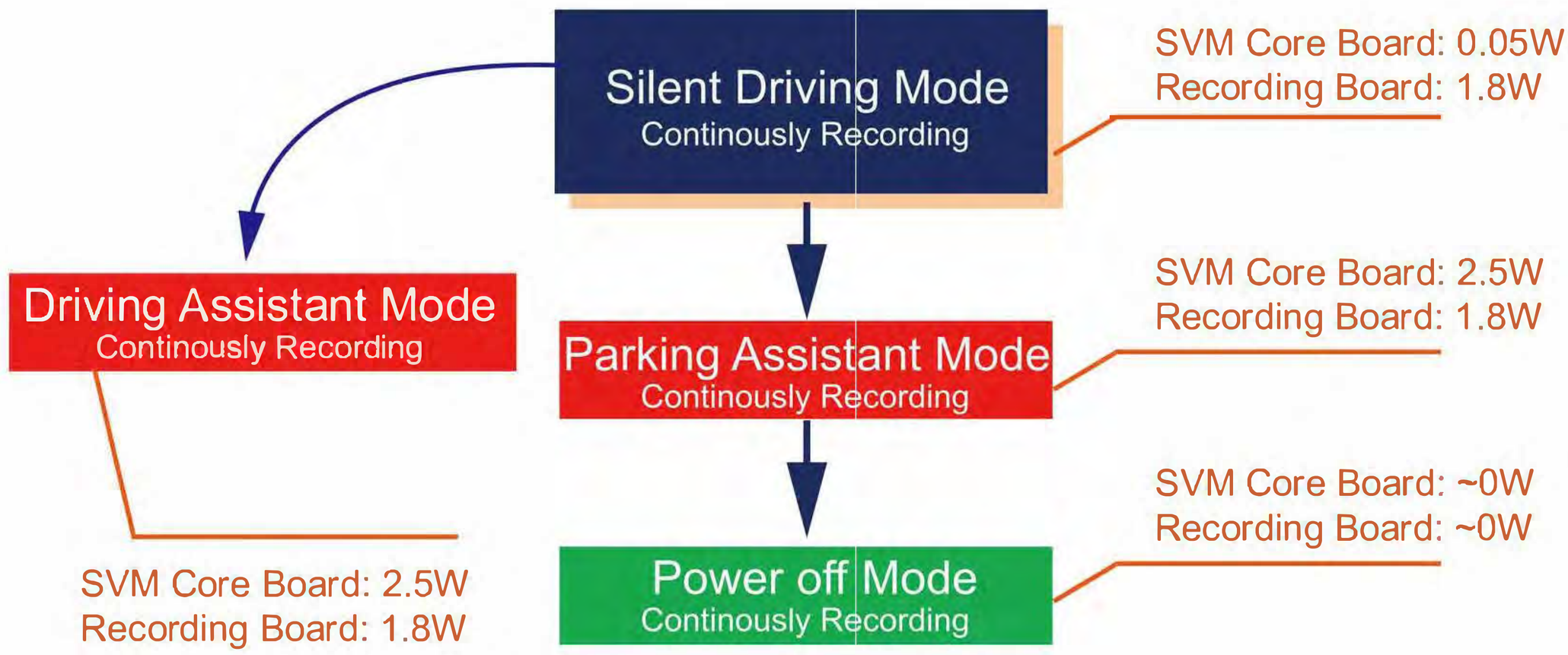
1. Long press “Mode” button to switch to recording system menu.
2. Press the “OK” button to stop current recording.
3. Using “Up/Down” button to navigate between recorded files as per date and timeline.
4. Press “OK” button again if the current recording file is just the right one you want to playback, and you can enlarge any of the 4 cameras to full screen mode by pressing left /right/up/down Button.

Recording Parameters

Basic Settings

Menu Item	List Options		Description
Date			Change system time
Language	English/Simplified Chinese		
Time Watermark	ON/OFF		
Format			Format the TF Card or USB Disk
Factory Reset			
Firmware Info			

Smart Power Management Strategy



Silent Driving Mode

Silent Driving Mode is the most frequency used while driving, the recording system will continuously take the outside video and record the compressed video on the recording media such as TF card or USB disk. Note that USB disk have a higher priority over TF card.

Driving Assistant Mode Parking Assistant Mode

During this mode, maximum power is expected to consume, since both the recording board and SVM core board is full functional. But this mode will never last for a long time, driving assistant mode is usually last for several seconds, and parking assistant mode usually work for 1~2 mins.

Power Off Mode

The system is power off except for the Real Time Clock chip and G-sensor, and the whole system is also capable to awake from the vibration events. But under some special case such like the battery is lower than 11V, and system will never be awaked except for the event of engine start.

Specification

Packing List

Host

Front Camera

Rear Camera

Left Camera

Right Camera

Remotre Controller

Main Wire Harness

Front Extend Cable

Rear Extend Cable

Left Extend Cable

Right Extend Cable

Drilling Bit

⚠ TIP ⚠

For button connection, one terminal connect to BAT+ on the power cable, the other terminal connect to High Beam (High beam is the small red cable on the front extension cable).

IR Receiver

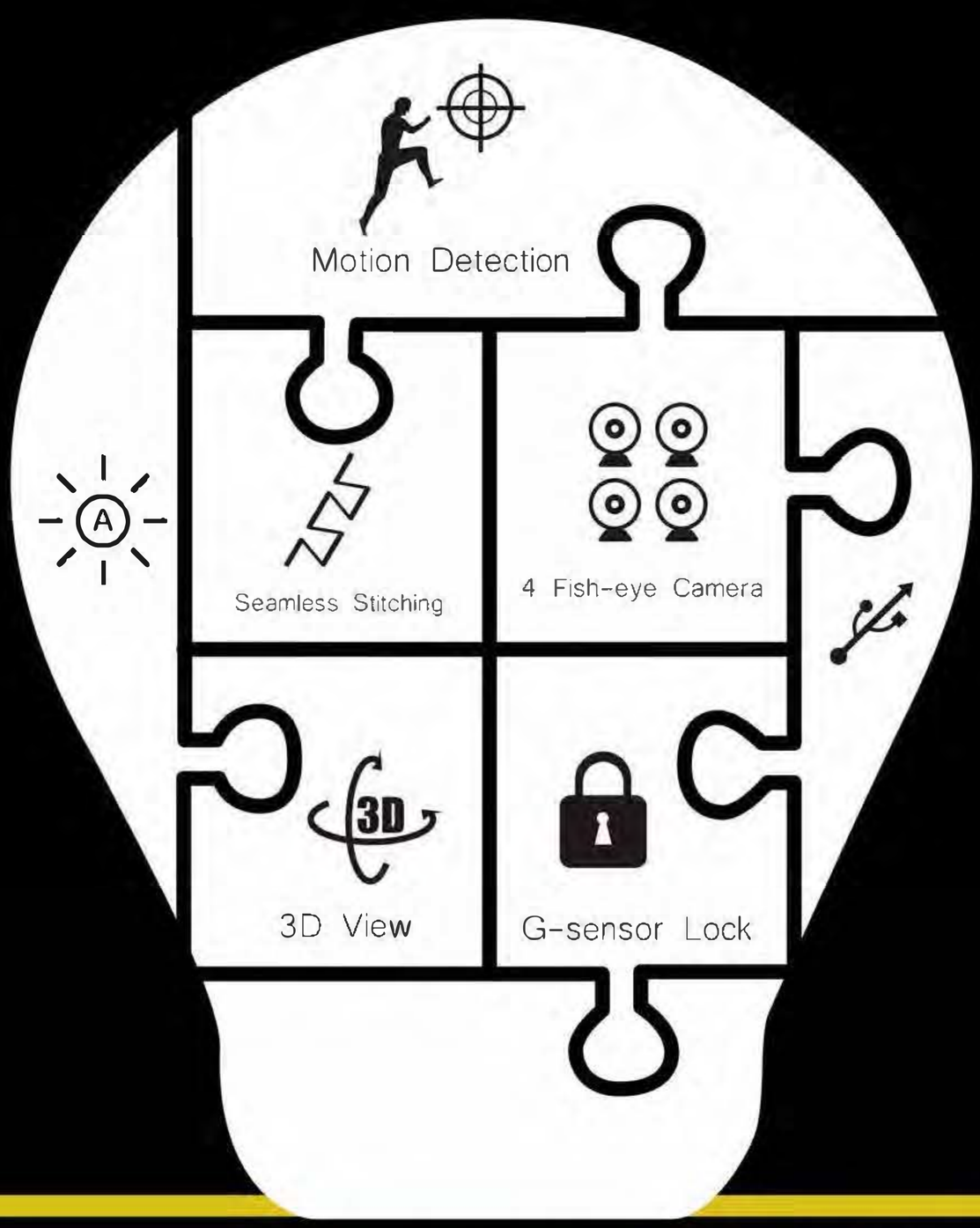
Calibration Tape

Button

Specification

Datasheet

Type	Specification	
Video	Video Interface	AV out / HDMI
	Input / Output Impedance	75Ω
	Amplitude	Typical 1Vpp, 1.2Vpp Maximum
	Bandwidth	27M
	Sampling Frequency	74.25MHZ
	Resolution	1280X720@30fps
	Signal standard	AHD1.0(Nextchip)
	SNR	70dB
Indicator Lamp /Blinker	High beam	Optional
	Left/Right Turning Blinker	Yes
	Reversing Lamp	Yes
G-sensor	BM250E	Bosch
Compression	Algorithm	H.264 Baseline@L3.1
	Resolution	1080p@15fps
	Bitrates	5Mbps, 3Gbyte/Hour
	Recording Media	USB Disk(High Priority)/TF
Disk Capacity	TF CARD	32G SDIO3.0/SDIO2.0
	USB Disk	32G USB2.0
Power Consumption	4-CH DVR + SVM mode	460mA
	4-CH DVR mode	200mA
	Sleep Mode	<10mA
Dimension	L*W*H	123*81*25mm(Host Metal box)
Weight		220g
Environments	Normal Working	-30℃~+85℃
	Storage	-40℃~+105℃
	Relative Humidity	0~95%
Voltage Tolerance	Working Voltage	9.5V~36V



International Enquiry:

Shenzhen Dalos Electronics Co., Ltd

Email : szdalos@yeah.net
Website : http://www.chinadalos.com

Surround View
Monitoring System

FAQ

1 Some part of the image is blank after execution of Fast Merging mode

If you are indeed confirmed that all these above-mentioned steps are correct, please use your smart phone to take a photo after you finish each step when move done all cross cursor to these corresponding calibration points to us, our system can dump all these calibration data to TF card and our technical team will help you to find the root cause of the problem once we get your calibration data. Please contact our sales if you need more instructions on how to dump the calibration data.

2 Picture after merging is not accurate or seamless

This problem is mainly caused by the installation position, and it usually occurs with the lower chassis vehicles .The picture quality captured by the camera will be poor and so that the calibration error will be magnified.
This issue could be result of lack of enough care taken while moving the cursor between the calibration points .

3 Some part of the picture after merging is mirrored

If you have selected some OEM camera from your own supplier chain, please confirm whether the image from the sensor is mirrored or not, and if mirrored, please choose the mirror function in the menu.

4 The corner part of the picture is blank

These problem may be caused by the camera itself, please make sure if the camera get sufficient pixel content after camera installation(whether the installation position is too close to the ground)

5 The merging result failed

1. Be careful to choose a proper vehicle size when starting the camera calibration. The vehicle type parameter must be set according to the size of the vehicle. Mismatch could result to such issues.

2. Make sure there should be no obtuse mistakes e.g., while calibrating the rear camera you are mistakenly choosing the front camera or making a mistake for the left/right direction.

3. Please use your smart phone to take a photo after you finish each step when move done all cross cursor to these corresponding calibration points to us, our system can dump all these calibration data to TF card and our technical team will help you to find the root of the problem once we get your calibration data. Please contact us if you need more instructions on how to dump the calibration data.