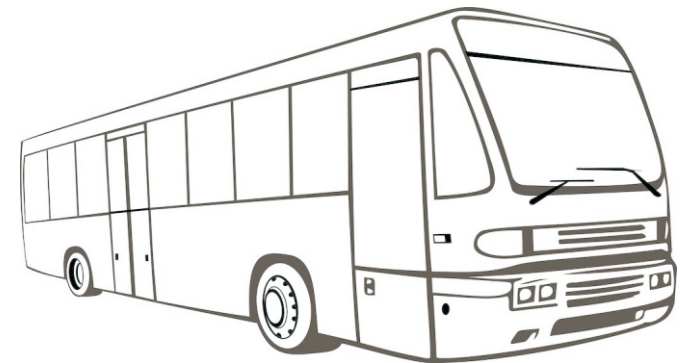


Surround View Monitoring System

Special for bus/ School bus/ Truck/ Fire engine

User's Guide



Please kindly read this guide carefully before using correctly

Safety Tips

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

Serious traffic accidents may be caused by keeping watching on the screen or operating the system during driving. It is strong recommended that do not operate this system while driving.

It 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. It may bring inconsistence between the screen image content with actual surroundings of the vehicle. Please handle this case according to actual situation.

Please contact professional installation service providers in case of any abnormal situations.

Never hotplug the host device when power is connected. The host device can't be sinked in any kind of liquid.

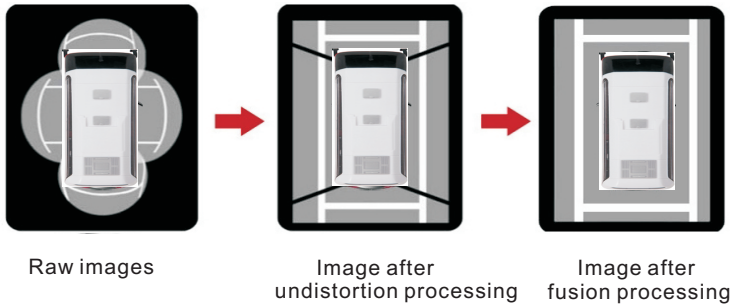
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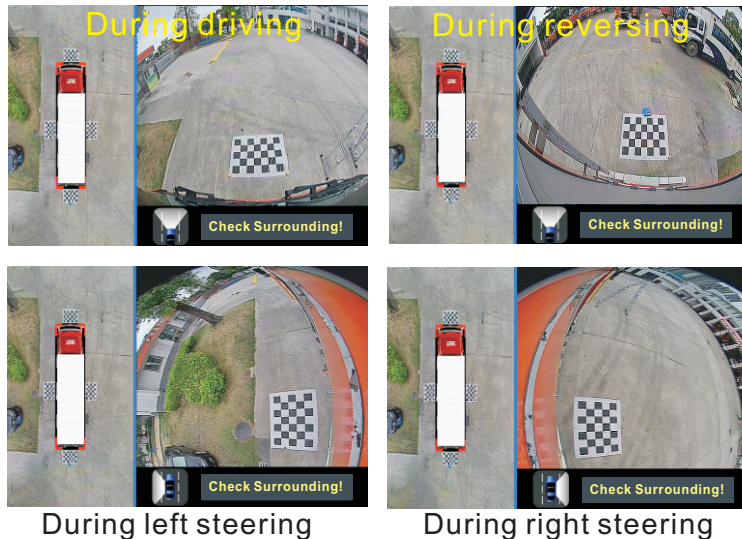
1.0 Brief Introduction of System

The surround view parking assistant system captures the images of four different views (front/rear/left/right), with the use of four ultra-wide angle fish-eye cameras installed around the vehicle. With the built-in advanced image processing and stitching algorithm, it timely and continuously synthesizes and shows the birdview image around the vehicle. The driver can intuitively observe vehicle position and surrounding obstacles, then bring the vehicle back to the parking space or pass by the complex road, to effectively avoid accidents such as friction, crash, fall, and so on.

Image synthesis processing theory



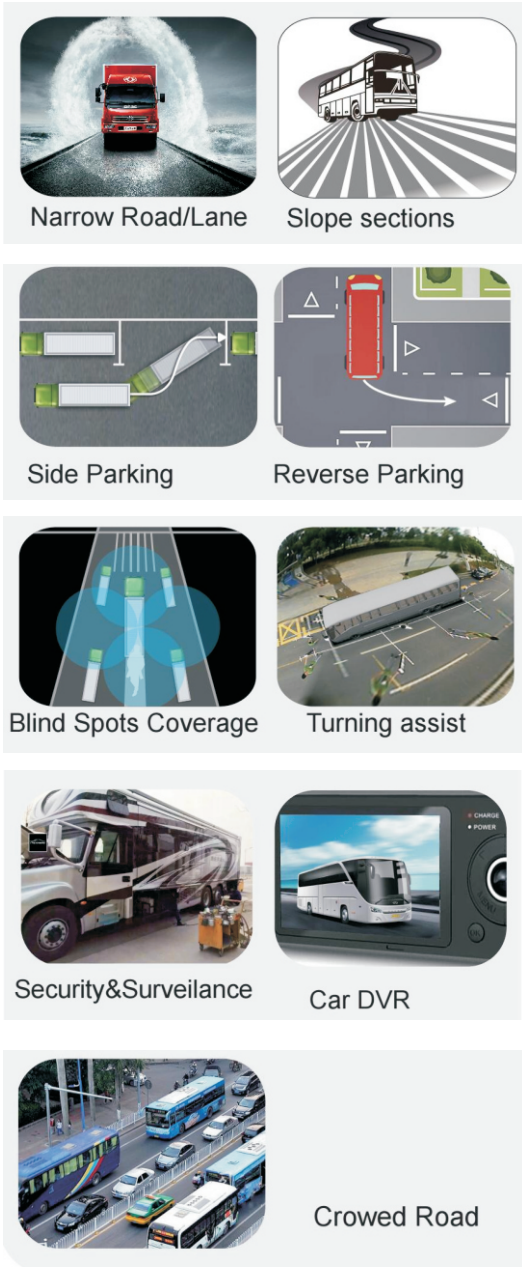
Output image shown during driving, steering or reversing



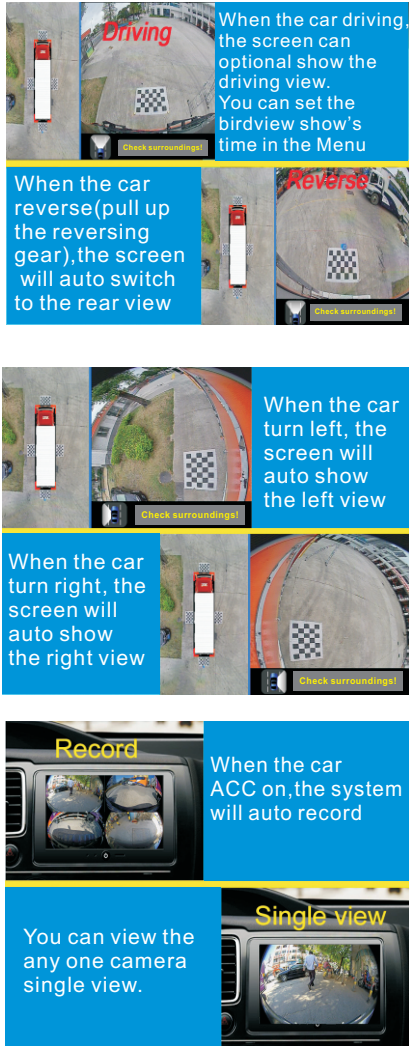
2.0 Product Features

- 2.1 Four 180° ultra-wide angle fish-eye cameras to provide raw images for processing
- 2.2 360° seamless birdview display without blind angle.
- 2.3 Automatic generation of birdview, easy calibration and operation.
- 2.4 Seamless video merging based on Quad core ARM CPU and hardware high efficiency acceleration engine.
- 2.5 Pixel statistic engine for brightness balance among four channels real-time outside cameras.
- 2.6 CVBS signal output display. (BDV06)
LVDS signal output display. (BDV09)
- 2.7 Support alternative recording media for TF card and USB disk
- 2.8 The system applicable for almost all types of vehicle, including Buses, Trucks, Lorries, Limousines, Tank and even Jumbo Jets. Typical length of the vehicle is 5.5m to 18m.
- 2.9 Smart power managements to save automobile's battery.
- 2.10 High video recording resolution up to 2560*1440
- 2.11 High quality for main chipset with well protected circuit and devices in order to achieve the best system performance and stability.
- 2.12 Support Multilingual.
- 2.13 Optional Birdview and Single view image.

3.0 Main application scenarios



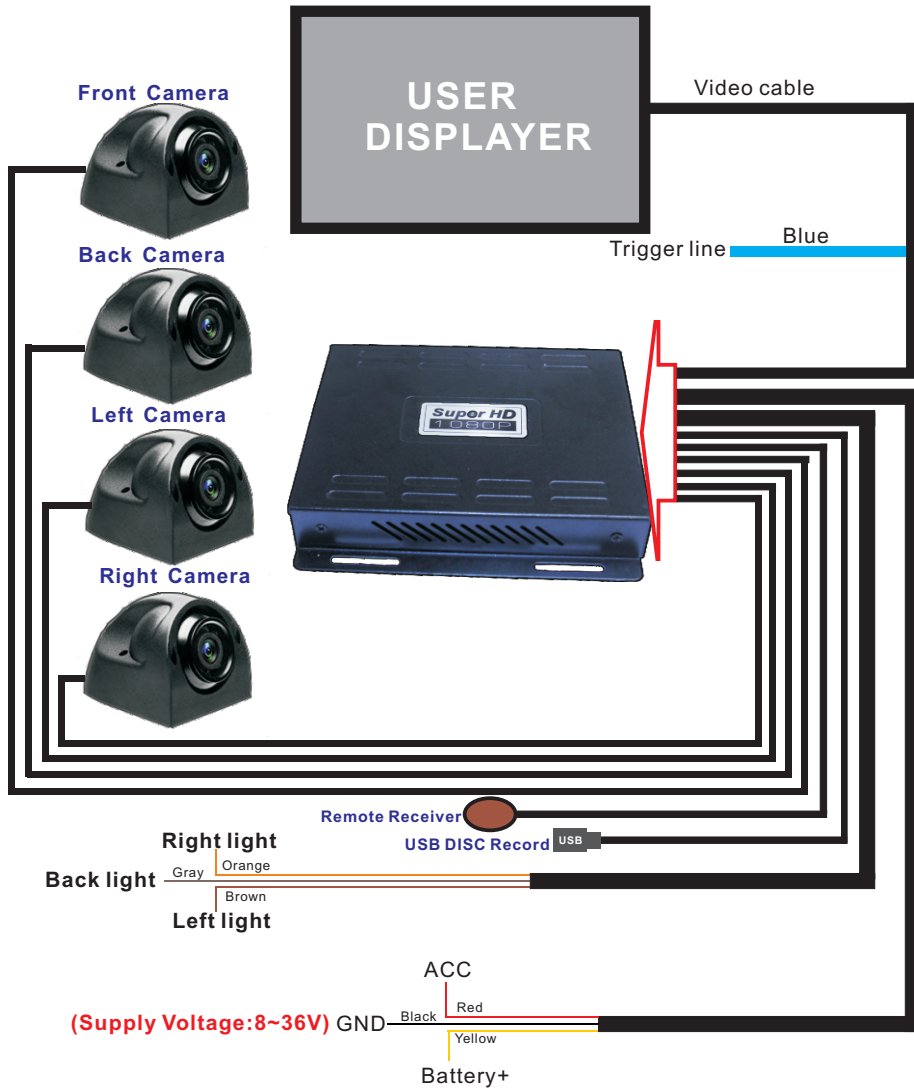
4.0 Features Profile



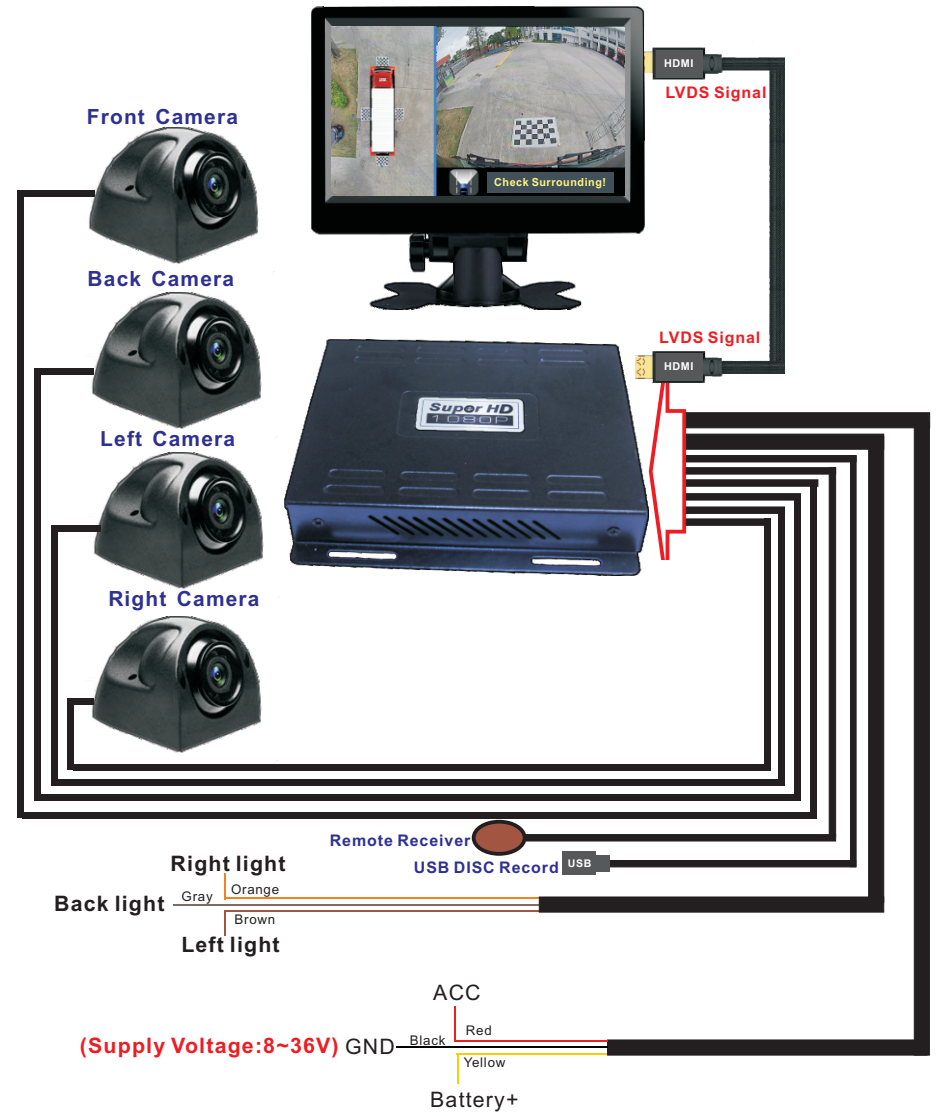
5.0 Specification

Host	CPU:Quad-core Cortex™-A7
	FLASH: 4GB
	DDR: 512MB
	Language: English,Russian, Japanese,Korean, Portuguese,German,Chinese, Chinese traditional.
	Working voltage range:9~36v
	Working current:<400mA
Cameras	Standby current:<10mA
	Working temperature range:-30℃~ 80℃
	Working humidity:40%~80%
	Optional: Camera Chip sensor Aptina AR0130 1/3 HD Sony sensor
	Effective Pixels:1280(h)*960(v)
	Horizontal resolution:960H
	Dynamic range:>78dB
	Video output: AHD
	Waterproof:IP67
	Video resolution:2560*1440
Displayer	Working voltage:3.3v
	Working current:<100mA
	Video input: LVDS
	IPS Displayer Resolution:1024*600

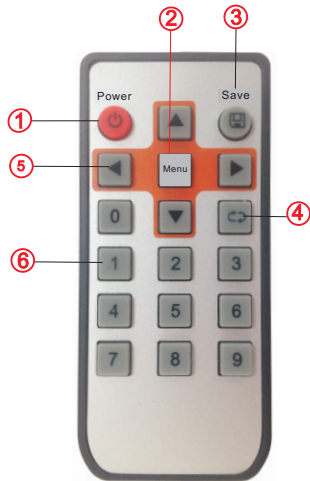
6.0 BDV06-Diagram



7.0 BDV09-Diagram



8.0 Remote control description



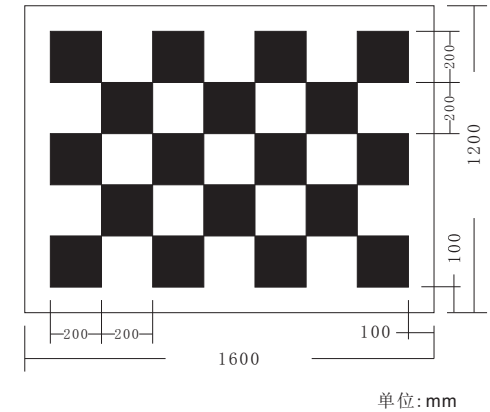
Key Number	Description	Functions
①	Power	Power on the system
②	Menu/OK	Enter the Menu/Confirm the selected option
③	Saving	Saving the setting and selected option
④	Back	Back
⑤	Direction	Select the Menu/Moving the cross cursor
⑥	Numeric keys	Input Numeric

9.0 Installation preparation

1). Prepare two 7.5M tapes and two 15M tape.



2). Prepare four pieces of 1.6M*1.2M checkerboard ruler cloth made of matte material, which is much better than reflective one and preferred for image identification.



3). Prepare drill, multimeter, screwdriver, Glass cement and other tools.

10.0 Product installation

10.1 Host installation:

- 1) Disassemble the panel of central control unit, and connect the reversing video channel of Lcd monitor or other display screen(AV in).
- 2) IR Receiver: Put the infrared receiver in a proper position.
- 3) According the diagram connect all the cables.
- 5) Fix the host device in the tool cabinet or the space behind the central control panel.
- 6) Connect all the cables for the coming function testing and debugging procedure, and assemble the panel back to the control unit.

! Noted: Although it can be anywhere inside the cab, it is very suggested to install the host under the steering wheel, the driver seat or the co-pilot seat, where is ventilated and easy to fetch memory card.

10.2 Displayer installation:

Install the bracket to the displayer ,fix the display to the proper position.



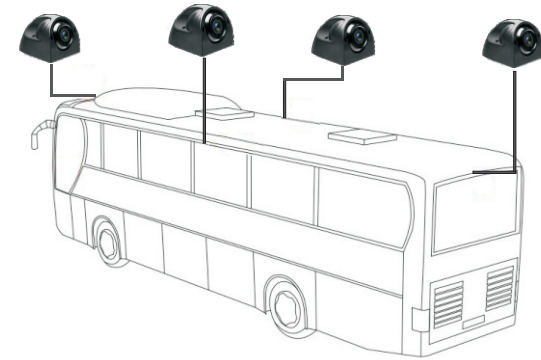
10.3 Camera installation

1) Unscrew this 4 screws, disassemble the camera base, Fix the base to the bus or truck proper location, use the Glass cement make the waterproof.



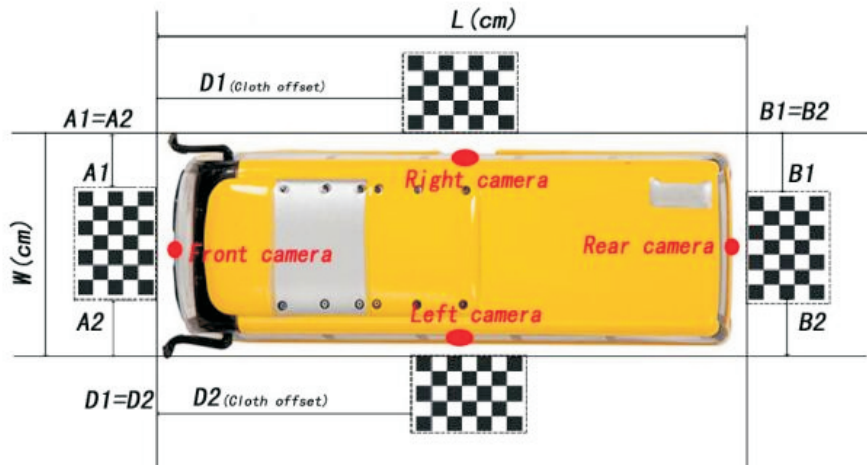
2) Please keep in mind that choosing a proper camera installation position to get as many pixel contents as possible while keeping the body of the vehicle visible. The camera optical axis should keep a vertical angle of 20 degree appropriately corresponding to vehicle body. Recommended to install all the cameras in the middle point of each top side which illustrated as follows.

3) Since the temperature is high in the hood, protect camera cable with isolation and keep it far away from hot parts. Also ensure cable junction waterproof.

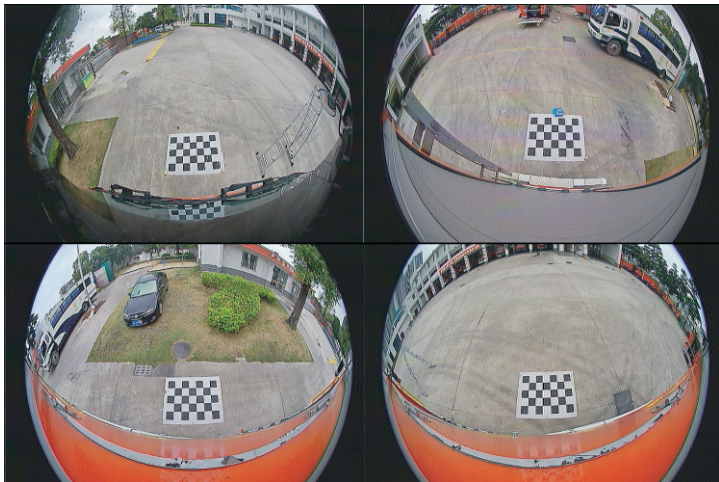


11.0 Place calibration clothes & adjust the cameras angle

- 1) Place the calibration clothes, the calibration clothes center line should aligned with the camera.
- 2) Measure the size, write down "L" (vehicle length), "W" (vehicle width) and "D" (cloth offset), where $D1=D2=D$, for further calibration step.

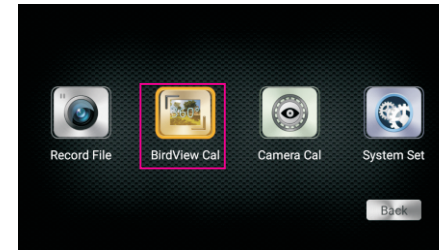


- 3) Adjust the cameras angle:
Adjust the four cameras angle, let the calibration clothes shows at the center of the view.

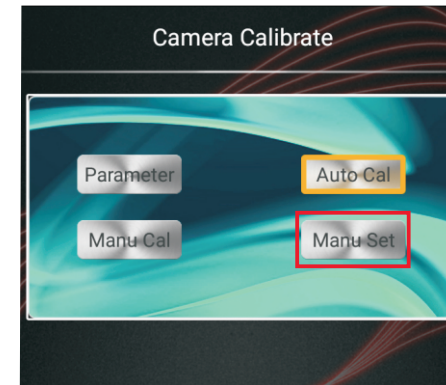


12.0 Birdview calibration

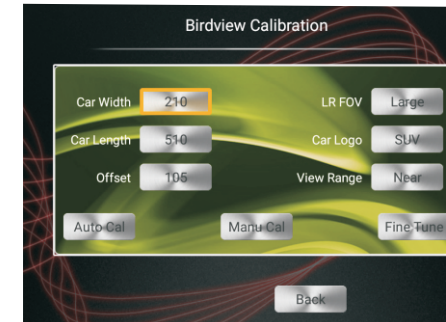
- 12.1 Press the Remote control **【menu】** enter the System main Menu and select "BirdView Cal"



- 1) Select **【Manu Set】**

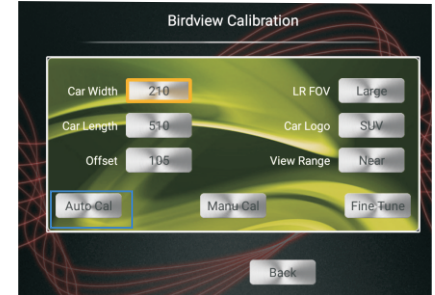


- 2) Input the car Width, Length, Offset data (cm).

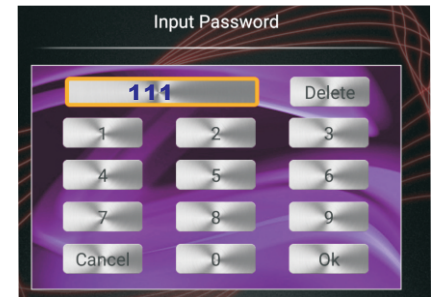


12.2 Automatic calibration

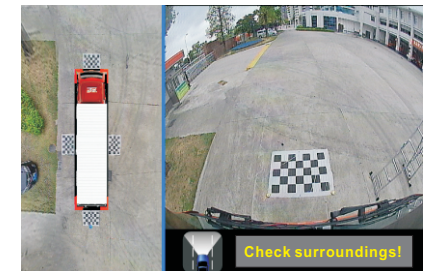
- 1) After input the car Width, Length, Offset data, select **【Auto Cal】**, click remote control **【OK】**



- 2) Input the password "111", press the remote control **【OK】**, the system will auto calibrate.



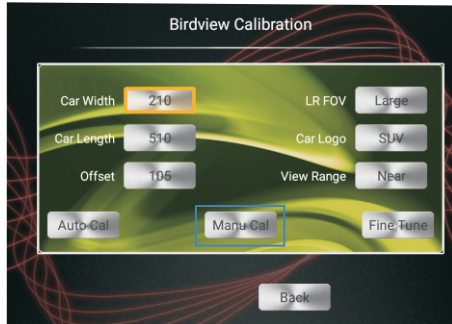
- 3) Check the effect image (as below picture) and save it.



- ! Note: if you satisfy the calibrated image, don't forget save it, Press the remote control **【save】**.

12.3 Manu calibration

1) If you don't satisfy with the Auto Calibration effect image, please select **Manu Cal** enter the calibration interface.



2) Click the remote control direction keys **[▲]/[▼]/[◀]/[▶]** to move the cross cursor to black checkerboard corners. Press the remote control key **[0]** to enter the fine tuning mode. After moving the cross cursor to the exact edges shown in the upper right zoom window, click remote control **[OK]** to confirm the coordinates.

Set black checkerboard upper left corner coordinates



Set black checkerboard upper right corner coordinates



Set black checkerboard lower left corner coordinates

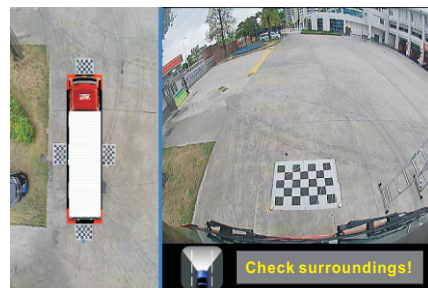


Set black checkerboard lower right corner coordinates



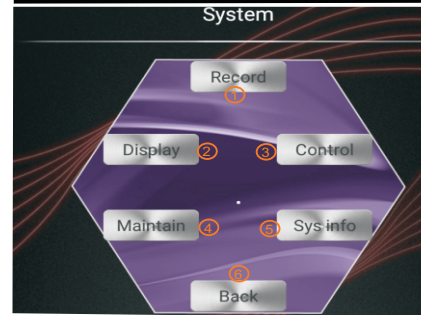
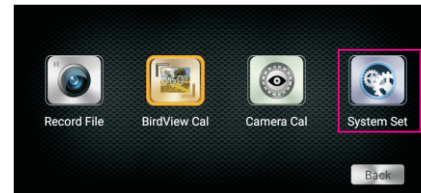
3) Calibrate all the other three lens in the same way.

4) After all four view images are calibrated, the image will show as below picture. click **[save]** to save the calibration.

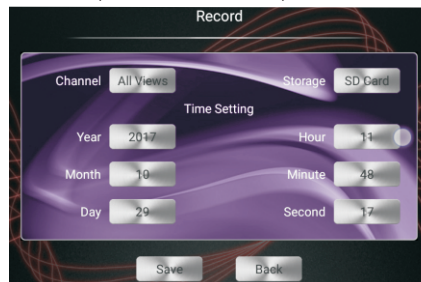


13.0 System settings

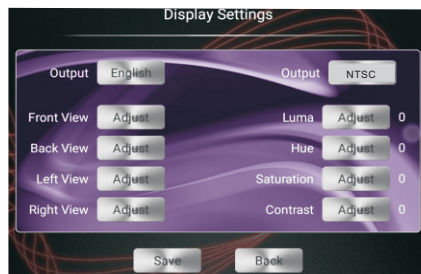
Press the remote control **[OK]** to enter the system main Menu. Select the "System set", enter to the "system" interface.



1) Select "1 Record" enter the Record interface, set the date time, save it.

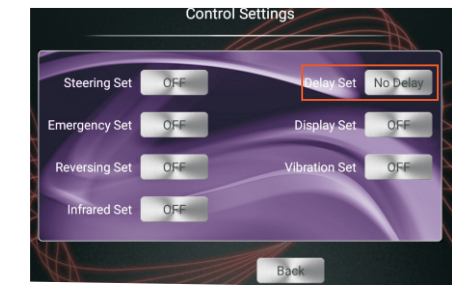


2) Select "2 Display" enter the Display Settings interface, set language and sign, save it.



3) Select "3 Control" enter the Control settings interface, set Delay Set, save it.

No delay: Don't shows the birdview when the car driving forward.
Never: Always shows the birdview when the car driving forward.
30s: Shows the birdview 30S when the car driving forward.



4) Select "4 Maintain" enter the System Maintain interface.

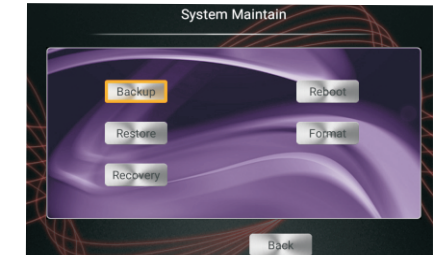
Backup: Backup the calibration data to the USB disc.

Restore: Restore the Backup calibration data to the new host.

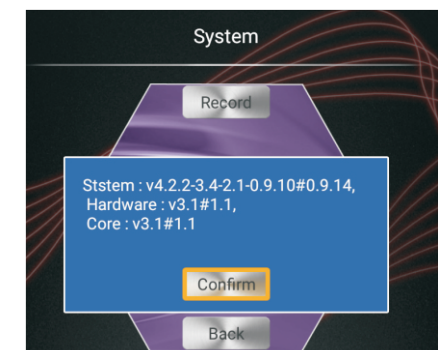
Recovery: Restore factory settings.

Reboot: Restart the system.

Format: Format USB disc or TF card.

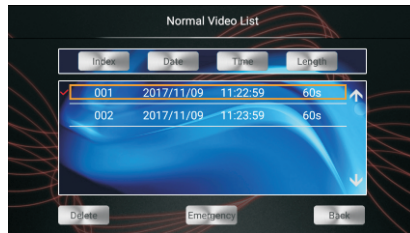
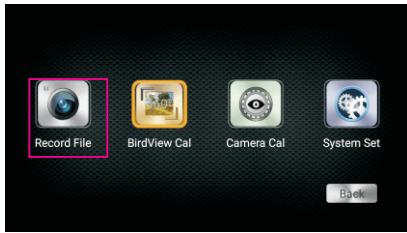


5) Select "5 Sys info" to check the system software version information.

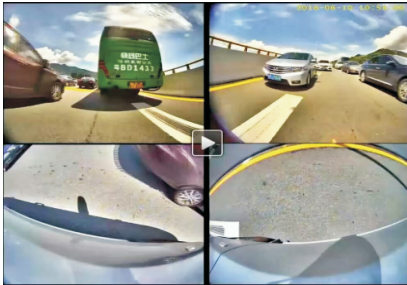


14.0 Driving Records

Press the remote control **[Menu]** to enter the system Menu.
Select "Record File" inter to "Video List" interface



Driving records of 4-channel view images



! Note:

Video files are saved in Micro TF card or USB disc,
It can be played in PC/PAD with card reader.


! Note:


If you don't need Birdview image, OFF the BirdView Mode, it will enter to the single image.
steps 11.0, 12.0 can be omitted.




Safety precautions


To avoid damage to people or loss to property, please pay high attention to the following items:


 Items with the sign are "prohibited".


 Items with the sign are "mandatory".


Only professional is capable for system installation and wiring, which requires specialized skill and experience. So please entrust it to distributor for safe.


 Do not use unsafe parts for system installation and wiring, especially for grounding wires.


 The system is designed for vehicles with 12V battery. To use it in vehicles with 24V battery, such as large trucks or low temperature diesel vehicles, may cause system damage.

 In case of thunderstorm, do not touch any connector to avoid electric shock.

 Strictly disconnect battery cathode during system wiring to avoid electric shock or injury due to short circuit.

 Do not damage cable, which may cause wire breakage or short circuit, which in turn may cause fire and system failure.

 Keep the host away from watering, humid or dusty

 Strictly follow this guide to do system installation and wiring to avoid fire and accident.