

3D-360

AROUND VIEW SYSTEM

USER MANUAL

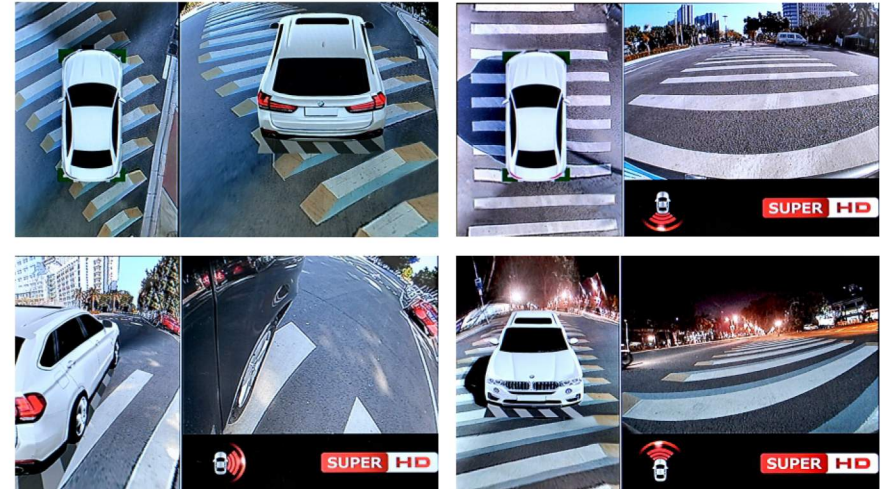


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Product Introduction

3D 360 panoramic parking system is through 4 ultra wide angle fisheye camera mounted on the front rear left right of the vehicle , collect images around the car body,after algorithm synthesise,form a 3D around view of car body,real-time transmit to the control screen, the driver through the display screen can directly view around the vehicle ,there will be not blind zone on the ground, help driver clearly confirm whether there are obstacles around vehicle, driving and parking more easily.



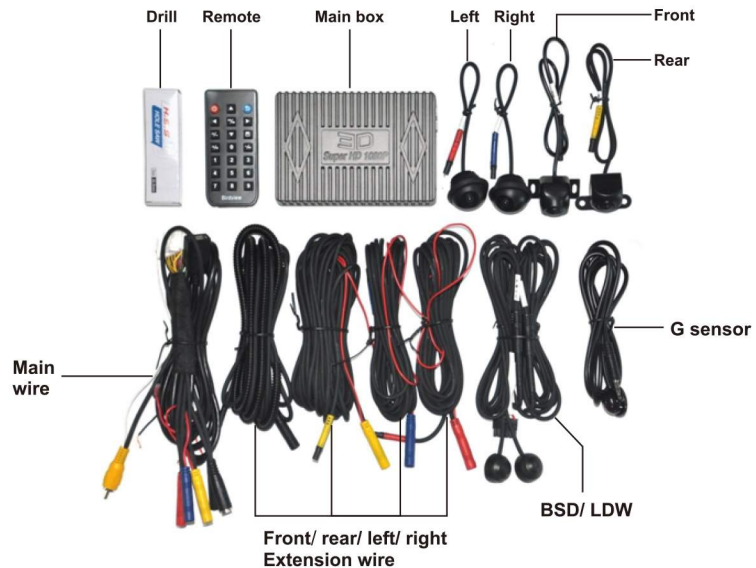
Product features:

- 2D、3D multi-angle, all-round perspective;
- Include: blind spot detection (BSD), ADAS functions such as lane departure warning (LDWS);
- Automatic calibration, calibration convenient;
- 4 road image real-time driving record, local playback;
- High-definition input signal, image quality is clear and fluent;
- The built-in CAN, compatible with a variety of cars (optional).

Product specification

camera	Video system	AHD720P
	Resolution	1280(H)X960(V)
	Aperture relative pore diameter	F2.0
	Minimum illuminance	0.005LUX
	Lens Angle	Vertical 130 Horizontal 180
	SNR	>60dB
	Dynamic range	82dB
	Waterproof	IP67
Control box	IC	High performance 4 core processor
	Storage	1.2G
	Output signal format	CVBS/VGA/HDMI
	Output video resolution	720X480/1280X720
	Input voltage range	9V~16VDC
	Current Consumption	≤800mA
	Quiescent dissipation	≤7mA
	Operating temperature	- 30℃~75℃
	Storage temperature	- 40℃~85℃

Product package introduction

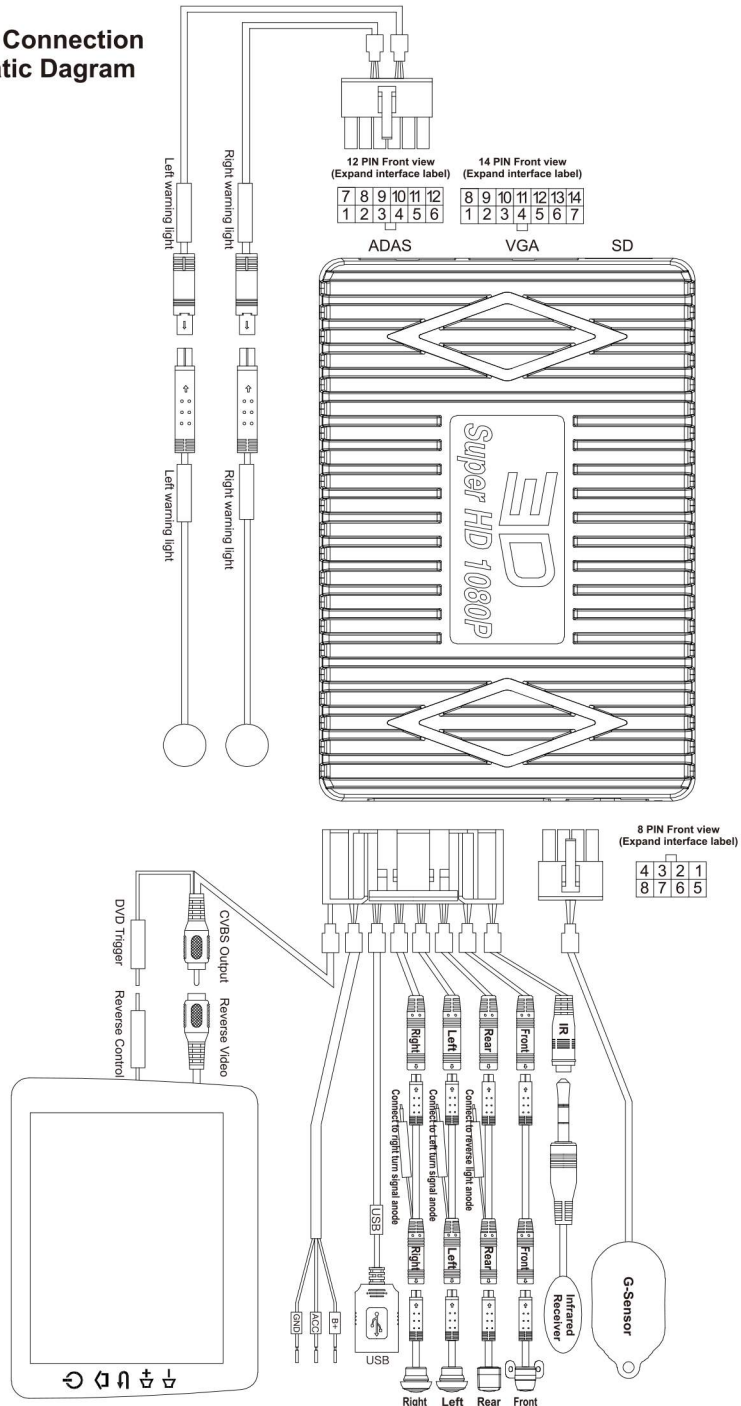


Remote Control Introduction



1. Start/close key: press this button to start or close the Birdview function.
2. Up key: move up or display front view.
3. Return key: return.
4. Left keys: move left or display left view.
5. OK key: confirm key, play or pause the driving video, enter the setting menu.
6. Right key: move right or show right view.
7. Parameter adjustment key: parameter +/- adjustment.
8. Down key: move down or display the rear view.
9. Save key: save parameters.
10. Parameter increase/quick return key: the parameter increases or the driving video is quickly back play.
11. Parameter reduce/fast-forward key: parameter reduce or driving video fast forward play.
12. 0-9 key: input 0~9 value.

System Connection Schematic Diagram



The relevant interfaces of the host and wiring harness are as follows:

1. Power connector: connect power supply (Power connect to car body B+, ACC, GND)
2. Each red line in the extension wire: connect to turn left, right and reverse light.
3. Black BMW connector: connect the front camera.
4. Yellow BMW connector: connect the rear camera.
5. Red BMW connector: connect the left camera.
6. Blue BMW connector: connect the right camera.
7. Yellow AV interface: Control box video output interface, connect to the central control display through video extension wire.
8. White DVD trigger wire: connect the navigation reversing test wire.
9. Black 3.5mm interface: connect to infrared remote control.
10. USB interface: connect U disk, which can be used for driving record, system upgrade and parameter storage.
11. Indicator light: the power status indicator of the control box, the control box engine is working normally when the light is on, the power supply is abnormal when the indicator light is off.
12. SD card interface: SD card can be inserted for driving record.

The power supply and the body signal line are connected:

- ① White line: connected to the control display of the reverse control line.
- ② Black line: connect to the body power supply
- ③ Yellow line: Connect the body of the car with a constant power of 12V.
- ④ Red Wire: connect the body ACC

8PIN Extension interface connection description:

- ① UART_TX: External CAN box or central control display touch TX.
- ② UART_RX: External CAN box or central control to display the touch of RX.
- ③ GND: Output Ground
- ④ B+: Output 12V power supply
- ⑤ G_SENSOR_CTL: Trigger signal of external shock switch
- ⑥ CANL: CAN Low input
- ⑦ GND: Ground
- ⑧ CANH: CAN High input

12PIN Extension interface connection specification

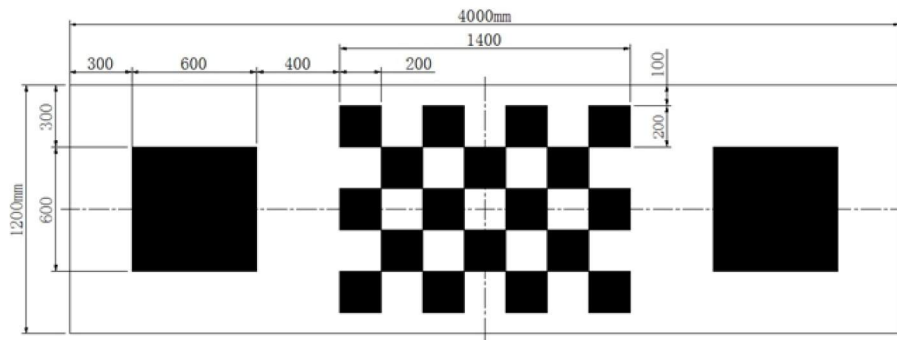
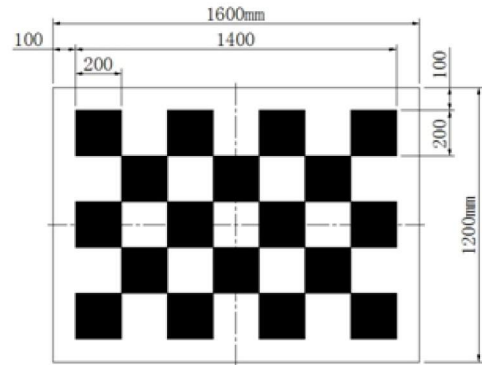
- 1、Right LED
- 2、Right LED Ground
- 3、Right Buzz Ground wire
- 4、Reserve
- 5、GND
- 6、Right buzzer power supply
- 7、Left LED
- 8、Left LED ground
- 9、Left buzzer ground
- 10、Reserve
- 11、GND
- 12、Left buzzer power supply

14PIN Extension Interface Connection Specification

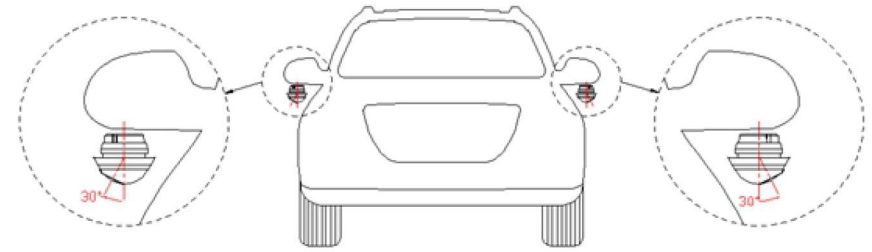
- 1、Reverse control output
- 2、12V Input
- 3、ACC Input
- 4、GND
- 5、TXD (connect outside RXD)
- 6、RXD (connect outside TXD)
- 7、GND
- 8、GND
- 9、VGA-VS
- 10、VGA-HS
- 11、VGA-R
- 12、VGA-G
- 13、VGA-B
- 14、Reserve

Product Installation

1. Prepare two 7.5m tapes ,two 5m tapes
2. Prepare 2 pieces 4m*1.2m and 2 pieces 1.2m *1.6m checkerboard calibration cloth. The matte fabric material will be better, reflective material isn't good for image recognition.

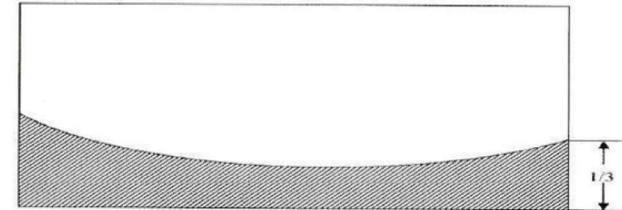


3. Prepare electric drill, multimeter, screwdriver and other related tools for drilling.
4. 360 control box installation
 - (1). The control box can be installed in any position in the car driving room, but for convenience of plugging the SD card, it is suggested that the installation should be close to the central control display at the bottom of the main driving or co-pilot seat.
 - (2).The 360 control box needs to be fixed firmly when installing to prevent vibration which will affect the file storage.
5. Camera installation
 - (1). Rear view camera: the universal rear camera is installed in the rear of the car, which is more than 400mm high from the ground. The image on the display screen is appropriate to see the car body. Special camera needs to be customized.
 - (2). Front view camera: the universal front camera is mounted on the front of the car, which is more than 400mm high from the ground.The image on the display screen is appropriate to see the car body. Special camera needs to be customized. Due to the high temperature in the engine room, the front camera extension wire need insulation sleeve, and the high temperature parts of the car need to be avoided when installing.
 - (3). Left view camera: the universal left camera needs to be fixed at the bottom of the left rearview mirror. The lens direction and the car body vertically outward 30 degrees (as shown below).Special cameras need to be customized.
 - (4). Right view camera: the universal right camera should be fixed at the bottom of the right rearview mirror. The lens direction and the car body vertically outward 30 degrees (as shown below).Special cameras need to be customized.



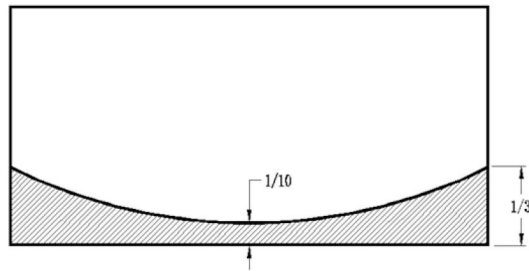
Calibration Steps

1. Adjust Camera Angle
 - (1). front and rear camera
 - The car body should appear below the camera image.
 - The front and rear bumpers should appear in the camera image within a third area, adjust the camera angle to the car body of the vertical ground 45 ~ 75 ° angle range, angle adjustment is completed, please lock the camera angle.



(2). Left and right camera

The left and right car body appears within 1/3 in the camera view, the center line of the camera incline toward the outside 20 ~ 35 ° , backwards 0 ~ 5° .



(3). Check the checkerboard image resolution

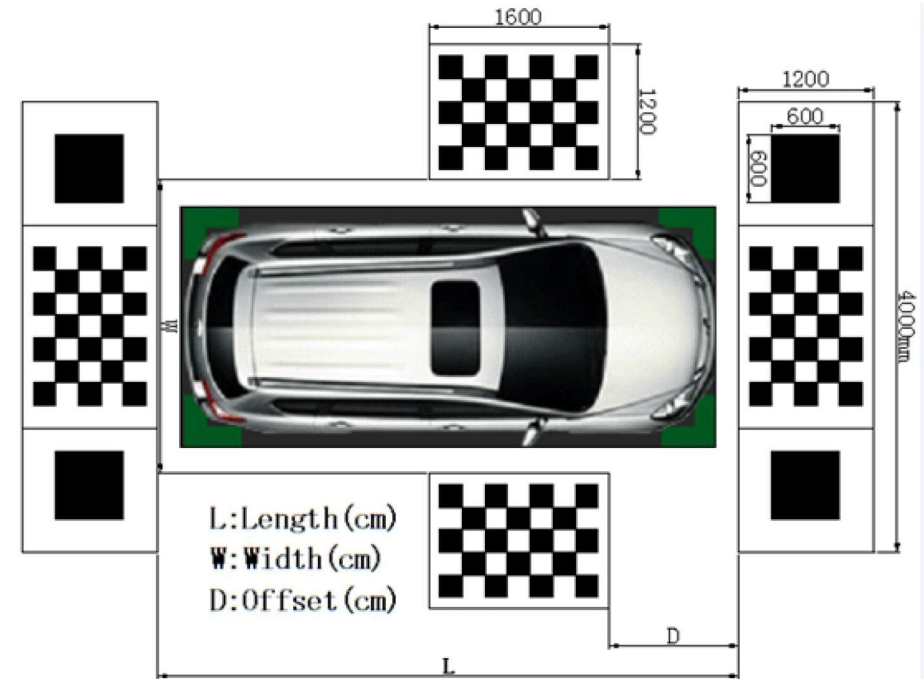
Entering into "Birdview" -> "Lens correct", check whether the checkerboard calibration cloth showing completely, whether the contour shows clearly. If incomplete or not clear, need to adjust the camera or external light, in order to achieve the above requirements.

2、 The placement of measuring tape.

- (1).First put the tape measure in front, measure the distance between the left and right tire to the tape , keep the same distance, then put the left and right tape, and finally put the rear tape. The width of the front and rear tape should be same, and the length of the left and right tape should be same.
- (2) .Adjust camera angle and tape position.

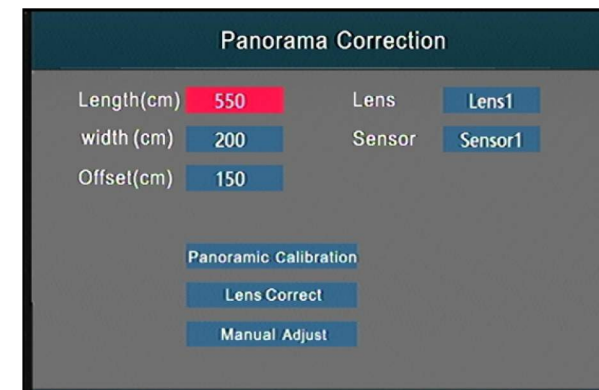
3、 The placement of calibration cloth.

- (1).The front and rear calibration cloth is based on the rectangle formed by measuring tape, put it to outside,the center line of the calibration cloth is required to be same with the center line of the rectangle.
- (2).The left and right calibration cloth is based on the rectangular box formed by measuring tape, put it to outside,the center line is aligned with the camera of the left and right rearview mirror.
- (3).Read "L" (gauge length), "W" (gauge width), "D" (offset position), and record, $D_1=D_2=D$.



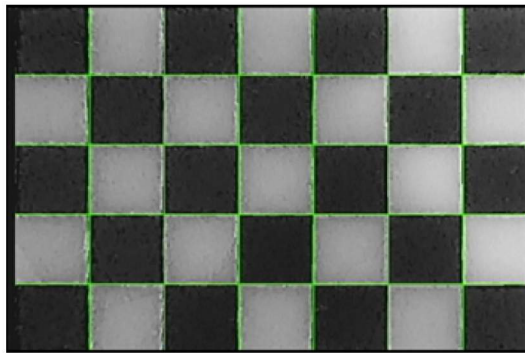
4、 Panoramic adjustment

- (1)、 After completing the above steps, you can enter the panorama mode. Press "OK" on the remote control to enter the Settings menu, and select "Panoramic Correction ".



Length : Use the remote control to input the calibration width "L" as "510", and the unit is: cm;
Width: Enter the calibration length "W" like "205" with the remote control, and the unit is: cm;
Offset: Use the remote control to input the offset position "D" such as "120", and the unit is: cm;
Lens: Select different options for different lens models. No customization use the system default value;
Sensor: Select different options for different sensor models. No customization uses the system default value.

(2). After Setting car body parameters , select "Lens correct",after entering the " Lens correct", front rear left or right single view can be checked, also can calibrate the distortion of the front rear left right four cameras to achieve better calibration effect, and the calibration working picture as below:



After the above parameters are set successfully, select "panorama correction" and press OK to enter the automatic adjustment.

After waiting for several minutes, the panoramic calibration is completed, the system will be restarted automatically, and after the restart is completed, the automatic correction process will be completed. If the correction fails, adjust the position of the calibration cloth or check the surrounding light.

Reasons for the failure of panoramic calibration:

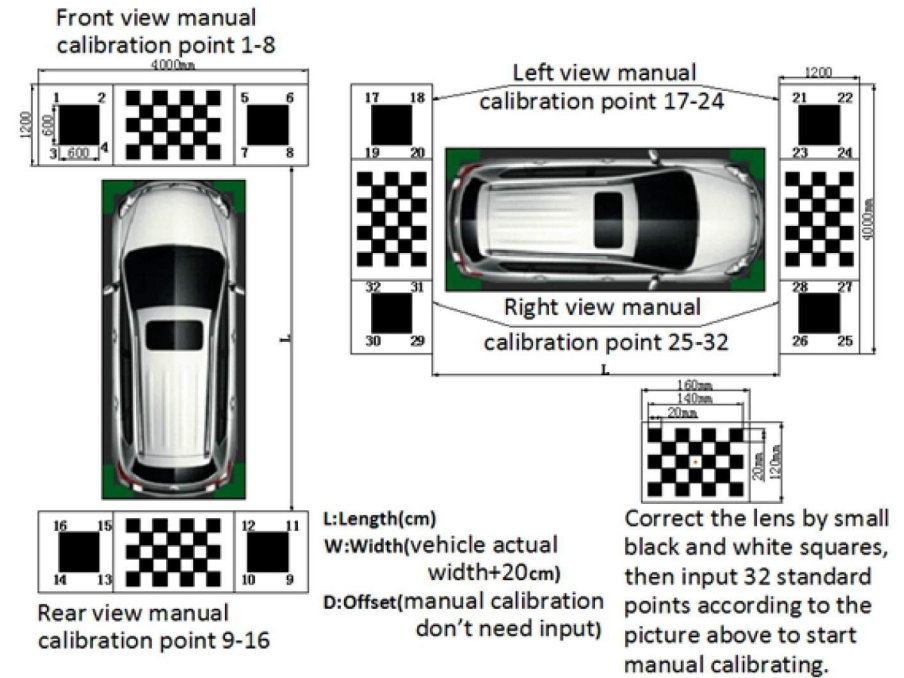
When the system shows "*** correction detection failure", please check :

- A、 The installation height of the camera is higher than 400mm. If not, please adjust the height.
- B、 Whether the image of the camera is exposed or too bright in the display screen, if so, please clean up the anti-spot and do shading.
- C、 Whether the image of the camera has obstructions. If so, please remove the obstructions.
- D、 Whether the image of the checkerboard calibration cloth is clear distinction between black and white, image is clear, if not, please check the lens or move calibration cloth to make the image clear.
- E、 Whether the front rear left right cameras meet the angle requirement.

After repeat the above steps, then carry out "panorama correction" ,until the panoramic correct is completed.

(3). Manual correct:

When the external light is not good, enter the "Manual correct" , manual correct the front rear, left and right cameras(in order to obtain better calibration effect, before getting into the "Manual correct", enter the "Lens correct", calibrate the distortion of the front rear left right four cameras) :



- Select 8 calibration points from front rear left and right each image;
- Calibration points position is 4 black and white grid points in 2 big black grid corner;
- Magnifying glass in the upper right corner to select the exact position;
- After the 32 points have been selected, the manual calibrate will be completed automatically and restarted.

Main Menu

Press "OK" on the remote control enter the setting in main menu



Driving record: Play/ quick return /fast forward /lock/delete the video of driving;

Record setting: Record switch , storage location, delay record, date setting,time setting;

Control setting: Set start mode, turn signals, emergency light control , trajectory switch, delay display, switch of BSD, LDW functions;

Calibration: Adjust the around view calibration;

Display setting: Set display mode, TV format, languages, camera display parameters, Left and right camera display at the same time, time display, etc.

Side view setting: Adjust single view display position, zoom, etc.;

System setting: Parameter management, system upgrades, formatting, and so on;

Version information: Check software version;

Record List

Record List				
Index	Filename	Date	Time	Run hours
000	A0000002.mp4	2016-01-01	00:16:13	00:06
001	A0000001.mp4	2016-01-01	00:16:05	00:01

In the main menu, select "Record List" to enter the drive record menu. At this time, enter the drive record list. You can select the travel record file to be viewed according to the record time. Press the "OK" button on the remote control to view it, and you can use "Parameter increase/quick return key", "Parameter reduce/fast-forward key", "OK key" on the remote control to control return, fast forward, play and pause of record play.

When play the record video, you can use the "Up key", "Down key", "Left key", "Right key" on remote control to check the single view big status video. Avoiding damage to the USB flash drive, please don't insert or remove the storage device while it is recording . The left picture shows the four views display from record list:

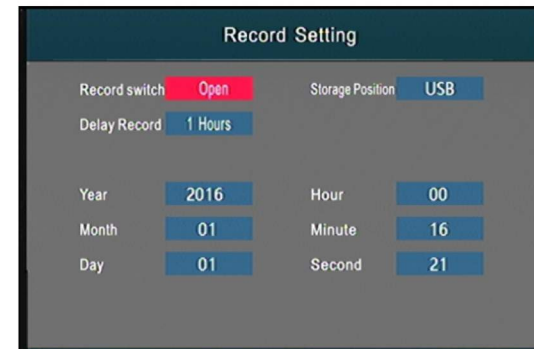


The following is a single view display of the driving record file:



Record Setting

Press "OK" key on the remote control to enter the main menu, select "Record setting" to enter the following setting interface:



Record switch: Select to open/close recording function;

Storage location: Optional USB/SD card as location for video storage;

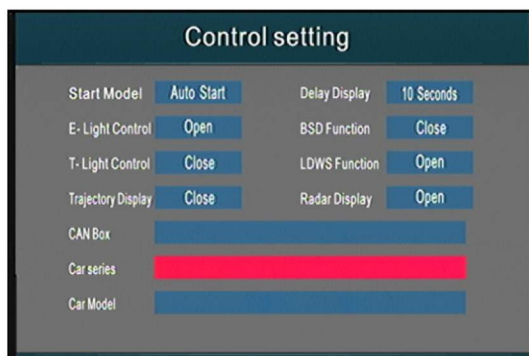
Delay record: After ACC OFF, the delay recording time can be set to: Off, 1 hour, 2 hours, 4 hours, 8 hours, 12 hours, 24 hours delay;

Date setting: Year, month, day, can be set;

Time setting: Setting hour, minute and second.

Control setting

Press the remote control "OK" to enter the main menu, select "Control Setting" to enter the following setting interface:



Start model: "Auto start": turn on automatically after opening the machine, close in 15 seconds after power on; "Intelligent start": The screen will not be automatically turned on after power-on, and it will light up when there is a trigger;

Emergency light control : "Open" indicates the system starts the panoramic image when the emergency light is on, "Off" indicates the emergency light does not control the image starting ;

Turn signal control: When image isn't showing on the screen,"open" means the system will start the panoramic image on the screen when operating the left or right turn lights , "close" means the system will not start the panoramic image on the screen when operating the left or right turn lights;

Trajectory display: "Open": When there is trajectory data, it will show the whole car trajectory lines;"Close" : it won't show the trajectory lines;

Radar display: "On": When there is radar data, the radar indication image will be displayed.

"Off": Does not display the radar image;

Delay display: "10 seconds", "30 seconds", "1 minute", "5 minutes": When there is a reversing, steering, emergency signal, etc. to open the video, if don't have other operations, display will exit automatically in these delay time, close video screen;

BSD function: "Open": Open BSD function, the specific alarm conditions are as follows:

When there is a blind spot on the left and right side of your vehicle, and the speed of another vehicle is faster than your speed of the vehicle, the LED will flash; if you change the lane when you hit the turn signal, the buzzer will give an alarm tone; "Close": Close BSD function;

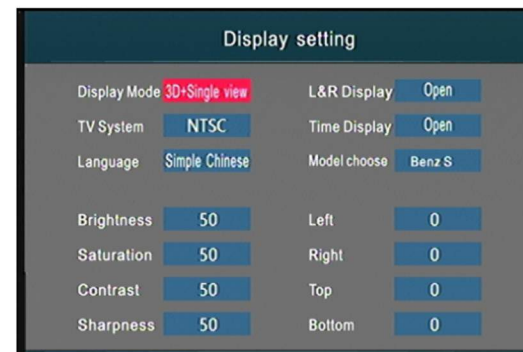
LDW function: "Open": Open LDW function, the specific alarm conditions are as follows: when the vehicle changes lanes to the left or right, if you don't operate the turn signal, it will sound an alarm. "Close": Close BSD function;

CAN box: "Built-in CAN": Use the CAN module inside the box, "external CAN box": use the external CAN box to collect relevant vehicle data (optional);

Car series: When the built-in CAN box is selected, the corresponding specific car series is selected here, such as: Audi, Honda, etc. (optional);

Car Models: When selecting the built-in CAN box, select the corresponding specific car model here, such as: Q7, A6L, etc. (optional).

Display Setting



Display mode: You can set various 2D or 3D display perspective modes, details are:

2D + Single View: 2D on the left, original single picture is on the right;

3D + Single View: 3D on the left, original single picture is on the right;

2D + 3D: Left is 2D picture, right is 3D picture;

Big 3D: 3D picture is in full screen;

2D + Mixed: Front & back are 2D + single picture, left and right are 2D + 3D;

TV system: NTSC or PAL;

Language : Simple Chinese or English;

Brightness: Set the brightness of cameras;

Saturation: Set the saturation of cameras;

Contrast: Set the contrast of cameras;

Sharpness: Set the sharpness of cameras;

Left and Right Display at the same time: "Open": when double flash is on, display 2D + left and right at the same time;"Close": when double flash is on, It won't display 2D + left and right at the same time;

Time display: Set the main interface, whether to display the time;

Model Choose: Select the vehicle model;

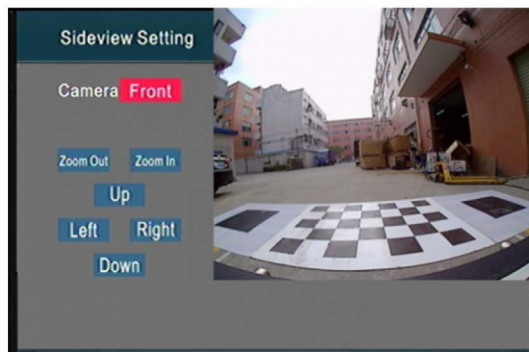
Left: Set the position shown on the left side of the view;

Right: Set the position shown on the right side of the view;

Top: Set the position shown on the top of the view;

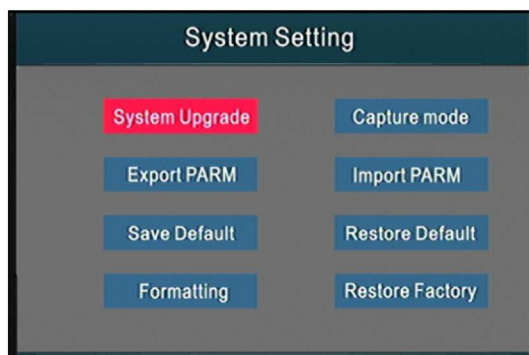
Bottom: Set the position shown on the bottom of the view;

Sideview Setting



Camera: You can set display area of side view for front, rear, right cameras;
Zoom out: Zoom out image area of the corresponding camera in the side view;
Zoom in: Zoom in image area of the corresponding camera in the side view;
Up: Move image area of the corresponding camera up in the side view;
Down: Move image area of the corresponding camera down in the side view;
Left: Move image area of the corresponding camera left in the side view;
Right: Move image area of the corresponding camera right in the side view.

System Setting



System upgrade: You can upgrade program of main chip and MCU, 2D/3D car model, UI image, etc.
Export parameters: You can export parameters to U disk;
Save the default parameters: Save the setting parameters in the machine as the default parameters;
Formatting: Format the current video storage device;
Capture mode: Capture original images in the current 4-way cameras;
Import parameters: You can import the parameters from U disk to the machine;
Restore default parameters: Restore the machine's parameters to the previously saved default ones;
Restore the factory setting: Restore the parameters of the machine to the original ones of the factory;

Version Information:



Display current version information of main chip and MCU