360° Panoramic Surround View Image System Product Introduction

一、Product overview

With the rapid development of image and computer vision technology, more and more technologies are applied to the field of automotive electronics. The traditional image-based reversing camera system only installs cameras at the rear of the car, which can only cover a limited area around the rear of the car, while The blind spots around and in front of the vehicle undoubtedly increase the hidden dangers of safe driving, and collisions and scratches are prone to occur in narrow and congested urban areas and parking lots. In order to expand the driver's field of vision, it is necessary to be able to perceive the 360° all-round environment, which requires the synergy of multiple visual sensors to form a complete set of video images around the whole vehicle through video synthesis processing. To meet such demands, the panoramic vision parking assist system came into being.

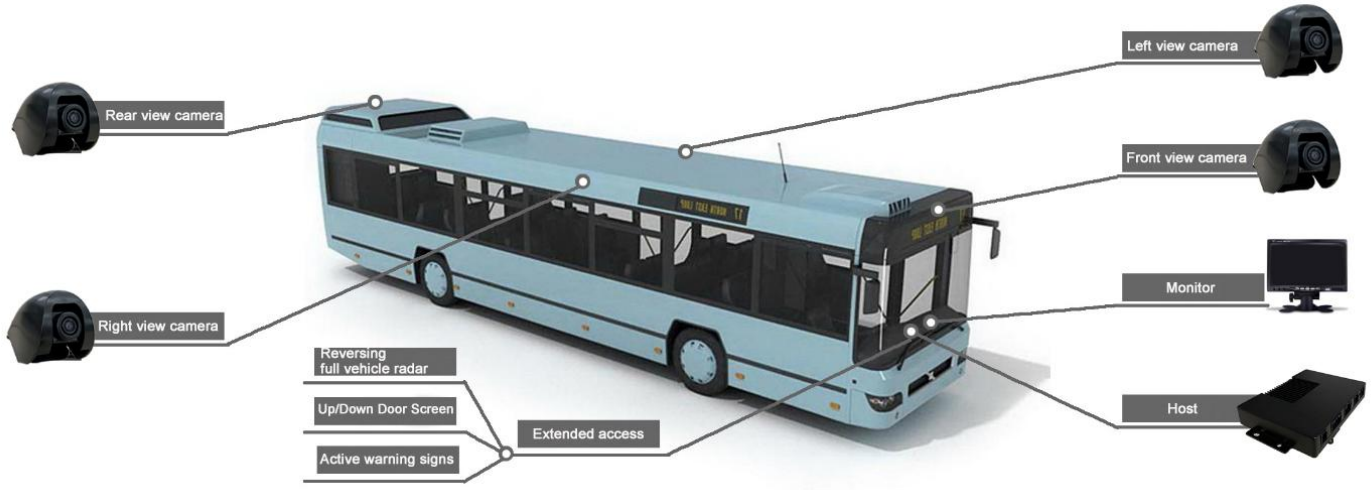


Figure 1.1 Schematic diagram of installation of 360° panoramic view system

The 360° panoramic surround view imaging system, by installing 4 to 8 wide-angle cameras around the car, which can cover all the fields of view around the vehicle, processes the multi-channel video images collected at the same time into a 360-degree body top view around the vehicle. Finally, it is displayed on the screen of the center console, allowing the driver to clearly see whether there are obstacles around the vehicle and to understand the relative orientation and distance of the obstacles, helping the driver to park the vehicle easily. Not only is it very intuitive, it can improve the driver's ability to calmly control the vehicle to park or pass through complex roads, and effectively reduce the occurrence of accidents such as scratches, collisions, and falls.

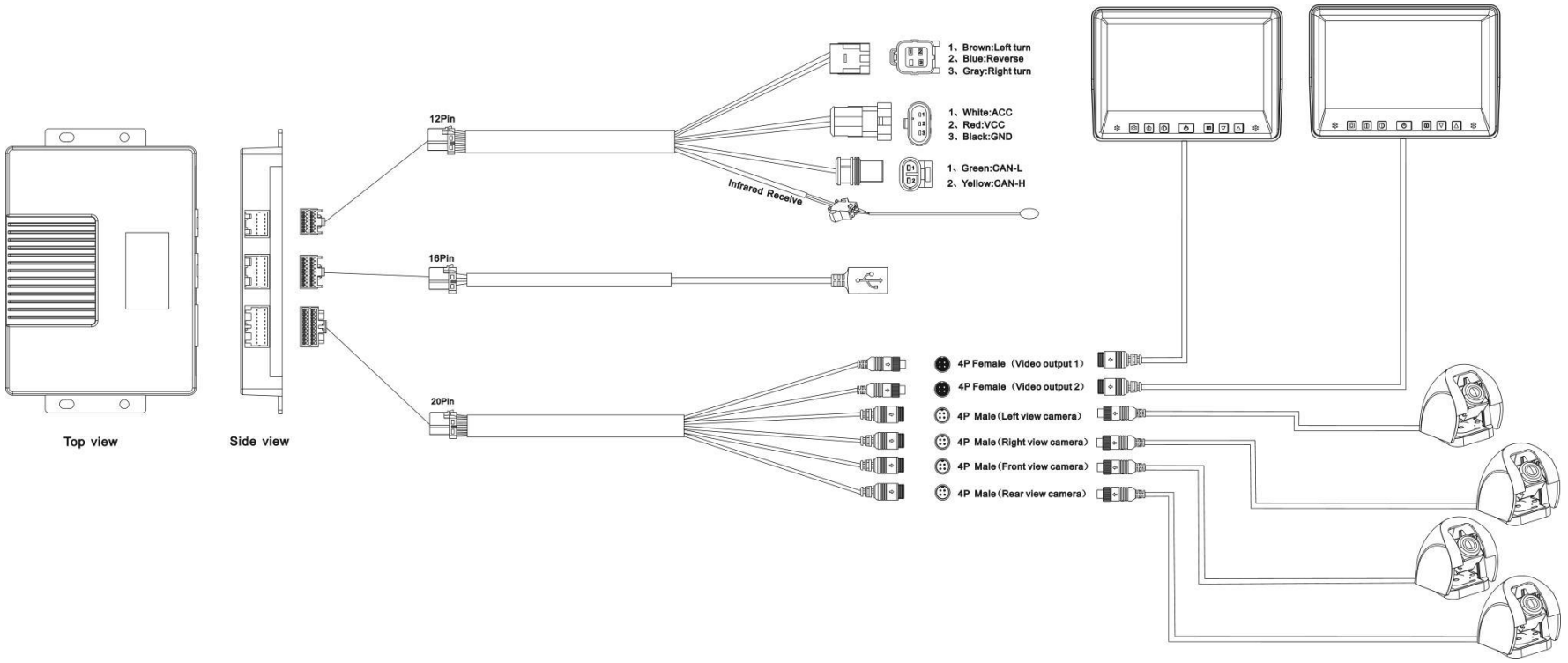
二、Product composition

The 360° panoramic view camera system includes a 360° panoramic main unit, a display screen, a remote control, a camera and a camera shield, and a wiring harness extension cable.

1. Working voltage: 9~36V;
2. Power of the whole machine: ≤15W, static about 550mA/24V;
3. Switch signal threshold: high level ≥ 3.7V, low level ≤ 2.5V;
4. Default video output format: CVBS (PAL);
5. Working temperature: -40℃~85℃;
6. EMI level: GB/T18655_level 3;

Serial number	Number	Specifications	Quantity	Unit	Picture
1	host	Main control Box	1	pcs	
2	patch harness	power patch harness	1	set	
		video input and output harness USB debugging harness			
3	camera	HD Starlight Night Vision	4	pcs	
		Special for truck			
4	camera extension cable	andard aviation head definition format	5	pcs	
5	monitor	7 inch/10.1 inch AHD monitor	1	pcs	

Wiring Diagram



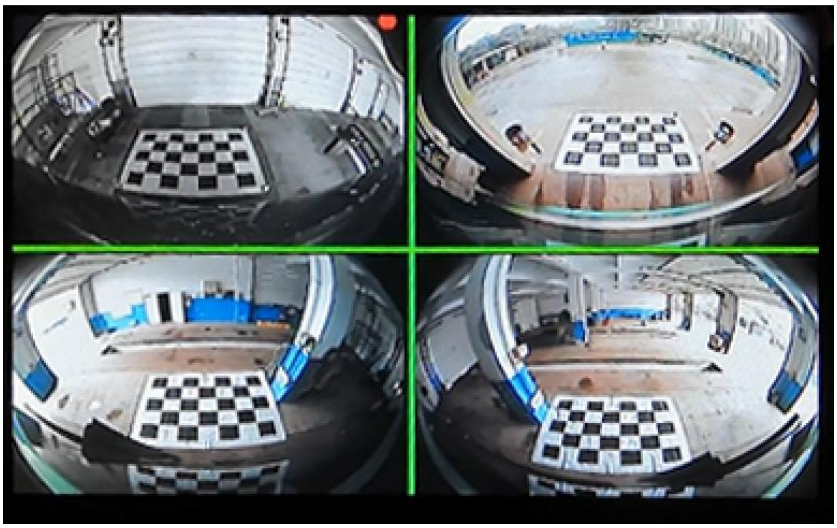
三、Features

3.1 360° panoramic view:

The 360° panoramic surround view image system adopts I.MX6 chip, and the image information collected by the four fisheye wide-angle cameras installed in the front, rear, left and right of the car is spliced into a whole mesh model of the three-dimensional surface, and then according to the selected After the distortion processing and color balance, a flat image is formed, and it is displayed on the display screen clearly and smoothly.

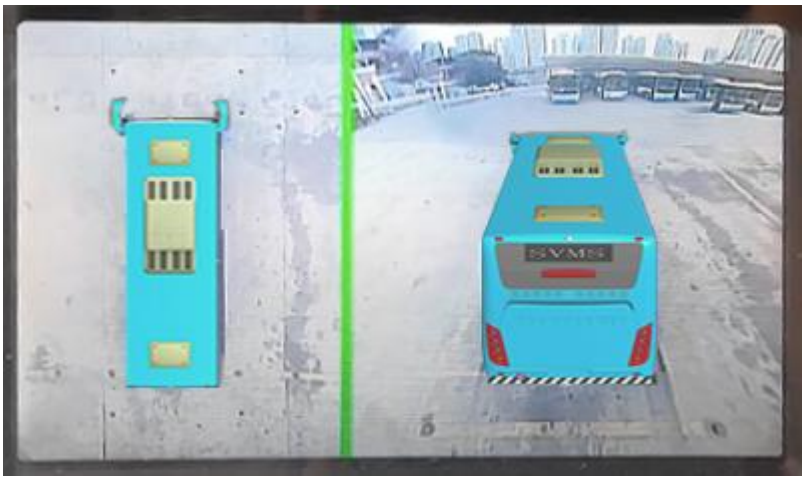
(1) The front, rear, left and right sides, the camera is installed in the center and horizontal installation position (the camera is obliquely downward at a 45° angle to the ground):

(2)Original 4 fisheye camera images：

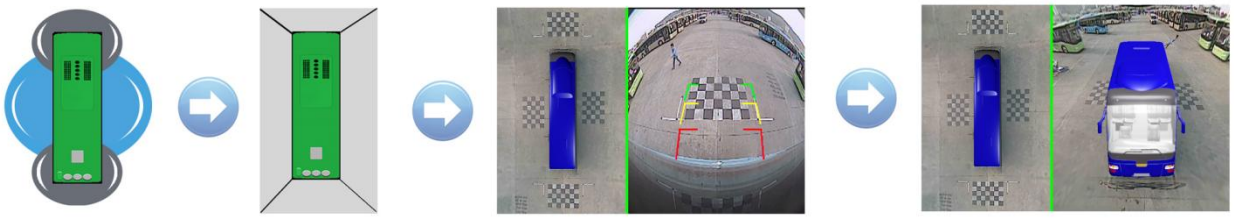


(3)Picture after fisheye correction and stitching:

(4)Color, Brightness Balance:



(5)Synthesis principle



Fisheye camera capture 4-way input screen 4-channel splicing screen 4-way splicing, 3D display screen

3.2 3D multi-view, automatic screen switching with vehicle signal

When the system is activated, the display screen shows a panoramic view around the vehicle body;

During driving, automatically switch the corresponding screen according to the direction lights and reversing signals;

No speed limit, clear and smooth images.

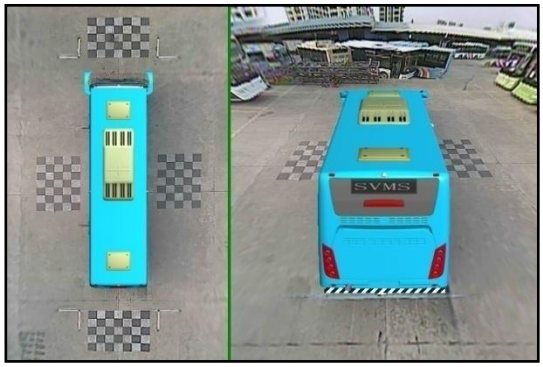


Figure 3.1 When the vehicle is parked or moving, the front view screen is displayed

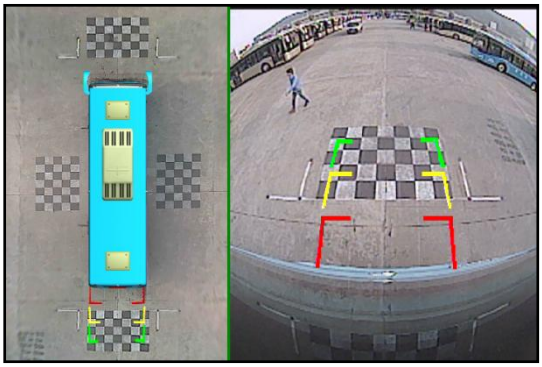


Figure 3.2 When the reverse gear is engaged, the rear view screen of the vehicle is displayed

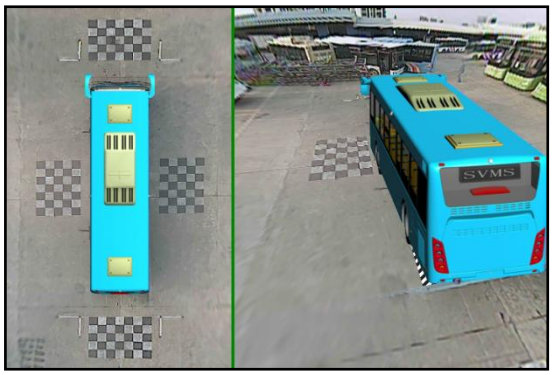


Figure 3.3 Turn on the left turn signal to display the blind spot on the left side of the vehicle

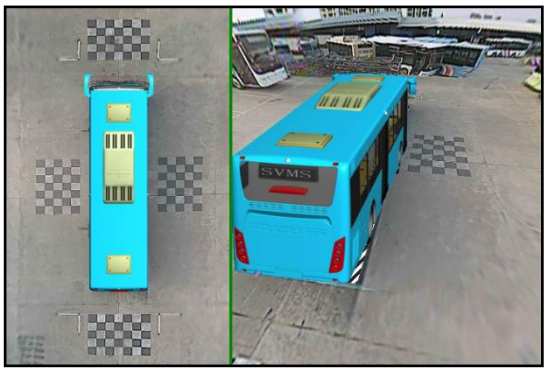


Figure 3.4 Turn on the right turn signal to display the blind spot on the right side of the vehicle

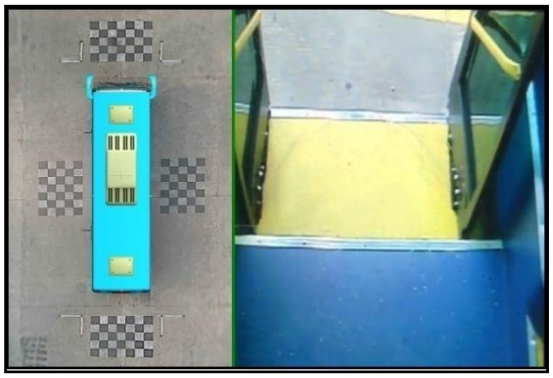


Figure 3.5 When the lower door is opened, the lower door monitoring area is displayed (5-way device version)

3.3 Support dual-channel different display output function

The full driving police supports 2 channels of video output and up to 3 channels of video output. Two of the video output pictures can be configured as independent video outputs. Another video output channel displays the four-square/six-square screen, and can also be customized into other output methods according to customer needs. High-definition output, the picture quality is clearer, it is an optional function.

3.4 Support 4-way/6-way driving record

4-channel/6-channel cameras record at the same time without missing seconds;

In-depth customization of the file system of the video storage to maximize the service life of the storage;

Loop recording, when the memory recording is full, the system automatically deletes the first recording file,

Free up space to store real-time video recording;

Maximum support 256G memory.

3.5 Support buzzer and horn sound output at the same time

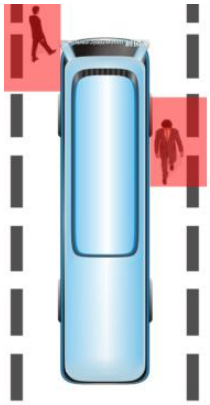
The buzzer sound is used as the upgrade prompt sound by default, and can be customized as the radar warning sound;

The horn sound is used for radar warning sound by default, and supports customization for various types of beeps and digital broadcast of specific radar distances.

3.6 Support intelligent track line and reversing prompt line

When the driver operates the car to reverse, two reversing guide lines will be dynamically displayed on the display screen, representing the running track of the rear wheels. As the steering wheel turns, the reversing guide line turns immediately, accurately planning the trajectory of reversing. This allows the driver to determine whether the car will hit the object behind the car if it reverses at this angle.

3.7 Support moving object detection at low speed



"Moving Object Monitoring" (MOD) driver assistance technology

that does not require the installation of additional sensors,

The function of the 360 panoramic surveillance image system

has been further strengthened in the case of the device.

When the vehicle is ready to start from a standstill, or is driving at a low speed (<10km/h), the system monitorsWhether there are moving objects around the vehicle. When the vehicle starts or turns at a low speed, the body must be When there is a moving object within the range, the display screen will flash in the corresponding area to warn, or through the bee The buzzer and voice remind the driver to improve driving safety.

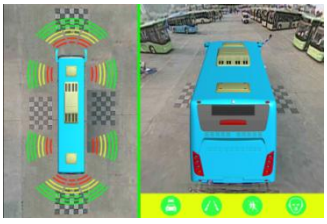
3.8 Scalable support for one-key alarm

In the event of an emergency on a bus, the driver does not need to call 110 to report Police, just press the emergency button, you can

Instantly capture the inside and outside of the car surveillance pictures and video, connected to the information dispatching command center of the bus company, and the real-time in-vehicle Picture and sound can be transmitted to the platform center synchronously, 。at the same time, the backstage system can also retrieve and save the audio and video data in the car and view the GPS location of the vehicle, which provides a good technical support for quickly mastering the scene situation, quickly commanding and dispatching the police to deal with the police situation, and effectively guarantee the anti-terrorism, anti-terror and safe operation of the urban bus system. One-button alarm function, but also linked to the car alarm device, the pickpocket crime on the bus better collection, fixed audio and video evidence, to the social bad elements play an effective deterrent, so that "bus pickpocket", "bus sexual predator" no place to hide.

3.9 Extended support for full vehicle radar, ADAS and other active safety warning

There is the blind spot in the rear view mirror, so you can't see the blind spot before you change the lane, if there is an overtaking vehicle in the blind spot, lane change at this time will occur collision.In heavy rain, fog, night light dim, more difficult to see behind the car, at this time, lane change will face greater danger, blind spot monitoring system is to solve the blind spot of the sight.



The whole vehicle radar warning, through 360° panoramic view of the external ultrasonic radar, actively detect pedestrians and obstacles in the blind area around the vehicle, to remind the driver, so as to avoid the accidents due to blind area in the starting or driving process.

3.10 Supports USB for system & program upgrade.

四、Product function

Item	Function	Spec
1	3D-360°Panoramic view	Support 3D effect around, stitching effect is nice, high definition, the field of vision is more than 4 meters around
2	Moving object detection	Panoramic view system with moving object detection function
3	Human-computer nteraction	The Angle of view automatically switches with gear position and steering signal, accord with driving habit, human-computer interaction interface can be customized
4	Applicable model size	4-way camera, support vehicle length ≤16m, within the width ≤2.8m of various models
5	Frame rate	≥25Hz/S
6	WHT BAL	The system has automatic white balance adjustment
7	video output	Support two channels of video output, the first channel output to the monitoring screen/central control screen, the second channel can access the vehicle DVR for video storage
8	The vehicle calibration	Manual calibration and automatic calibration are supported： （1）The camera is fixed at an Angle of 45° diagonally downward on the production line； （2）When off the production line, use automatic calibration, calibration time of each car within 5 minutes；
9	Camera protection	The camera assembly is equipped with a protective cover, which is fixed by a buckle type
10	Electrical and electromagnetic compatibility performance requirements	Meet GB/T18655 and other national and industry standards

五、**Product parameters**

5.1 List of product specifications

Item	Device parameter	Performance index
System	operating language	Chinese
	operation interface	Graphical menu operation interface
Video	video input	4 channel 720P
	video output	3 channels of video output，among 2 channels is CVBS output，1 channel is VGA HD output
	video display	Double screen, four screen display, double way different display
	Video Standards	CVBS PAL、VGA
	image compression	H.264 Main profile
Image storage	image format	D1(720 X480)
	Video streaming standards	ISO14496-10
	Video bitrate	480P：≤2048Kbps
	data storage	Support TF card storage, USB storage, access to DVR storage
Communication interface	USB	One USB2.0 interface
	SD	One SD card port
	Switch	4-way IO input, 2-way IO output
	Serial port	2-way RS232 port (one of which supports customization as RS485)
	CAN port	1 CAN port (speed configurable)
Software upgrade	This machine supports system and program upgrade through U disk	

5.2 Host working parameter list

Project	Working parameters	Instruction
Power input	9~36V	Input voltage is +9V～+36V
Power output	12v	Powering Monitors and Cameras
Total power	≤16W	It is expressed as the maximum power, and the normal work is lower than this value
Turn left, turn right, reverse, open and close the door signal	≤35.8V ≥3.77V	One signal line each for left turn, right turn, reversing, door opening and closing signals

Video input impedance	75Ω	Each video input impedance is 75Ω。
Video output	1Vpp	Output a 1Vpp CVBS analog signal.
CAN interface		Support 1 channel CAN interface, 1 channel high-speed CAN interface, a total of two CAN interfaces
SD card interface		Compatible with common brands in the market, it is recommended to select at least CLASS 10.
Operating temperature	-40℃~85℃	Equipment normal operating temperature limit

5.3 Camera technical parameters

Product	720P-fisheye camera
Sensor	1/2.8" 2.0 Megapixel SONY Cmos
Chip	IMX225 + NVP2441H
Pixel	1280*720(million)
Minimum illumination	1lux@60IRE，Starlight night vision level
Shutter speed	Auto (1/25,1/30 ~ 1/10000s)
Frame rate	25/30fps @1280×720P
Video output	AHD;PAL & NTSC
Signal to noise ratio	>60dB
Noise reduction	2D/3D DNR
Maximum current	<100mA
Power supply	DC12V ±10%
working environment	-30 ℃ ~ 85℃
Perspective	level 180180°
Mirror	Positive
Protection class	IP67