5/7-inch Automotive Thermal Imaging Night Vision System

User Manual





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Introduction

In recent years, with the rapid development of artificial intelligence and autonomous driving technologies, numerous driver assistance systems have emerged in the market. Various innovative technologies can enhance driving comfort and safety without interfering with the driver's operation.

The core function of many driver assistance systems is to alert drivers in advance to potential dangers, thereby avoiding traffic accidents.

Our company's latest product, the "5/7-inch Automotive Thermal Imaging Night Vision System" (hereinafter referred to as the "Night Vision System"), is designed to meet this demand.

Without the "Night Vision System," drivers may struggle to see distant pedestrians clearly when driving at night on poorly lit roads, or when facing oncoming high beams, rain, fog, or haze. This increases the risk of collisions with vulnerable road users (pedestrians, bicycles, motorcycles, electric vehicles, tricycles, animal,etc.), potentially leading to irreversible losses. In such situations, if the vehicle is equipped with our "Night Vision System," the thermal imaging camera can capture far-infrared thermal radiation emitted by pedestrians animal and other objects. The system forms video images based on the intensity of the thermal radiation, significantly enhancing the driver's visibility. The "Night Vision System" also features advanced pedestrian recognition and early warning capabilities, allowing

drivers to navigate complex nighttime road conditions safely and avoid dangerous situations.



The image above shows how the "Night Vision System" displays pedestrians and road conditions that are invisible to the naked eye. Pedestrians are highlighted in red to indicate potential collision risks. The system can also provide audible alerts, giving drivers ample time to respond to such dangers and reducing nighttime traffic accidents.

Welcome

We warmly welcome and thank you for choosing our company's "Night Vision System."

This product incorporates advanced stabilization technology, sensor technology, image processing technology, and efficient multi-threaded deep learning AI recognition algorithms. It is designed for the automotive aftermarket as an auxiliary driving product for use in nighttime and adverse weather conditions. The product uses an uncooled infrared detector and a low-power, high-performance AI SOC. It features black barrier penetration (imaging in complete darkness), anti-glare, and the ability to see through smoke, fog, and haze. The 5/7-inch display unit comes with intelligent pedestrian detection animal and collision warning functions, significantly improving nighttime driving safety. The integrated display algorithm design also greatly reduces installation difficulty.

Before installing and using this product, please read this manual carefully and keep it for future reference. We hope this product meets your needs and serves you well for a long time!

Our company reserves the final interpretation right for any discrepancies between the product's features and operations due to software or hardware upgrades and this manual.


Night
Before
Dazzle
Before
Fog
Before
After
After
After

Precautions

- Thermal imaging technology is widely used in military and aerospace fields. This product is only suitable for civilian auxiliary driving scenarios. Please comply with relevant national laws and do not use it for any illegal purposes.
- Operating temperature: -30°C to 70°C. Please use the product within the specified temperature range.
- The camera has an IP67 waterproof rating, while the 5/7-inch display host has an IP66 waterproof rating.
- The lens surface is coated with an anti-reflective film to improve image quality. When cleaning the lens, do not touch it directly with your hands to avoid damaging the coating with acidic substances from your fingers. Use a dedicated lens cloth or glasses cloth instead.
- Do not point the lens directly at the sun, large lasers, welding machines, or other strong light sources for extended periods, as this may damage the delicate optical components.
- Thermal imaging works by detecting temperature differences on object surfaces. As the ambient temperature rises, the contrast of the thermal imaging decreases, reducing the temperature difference between humans and the environment. This is a normal phenomenon.
- To ensure continuous high-quality imaging, the system's thermal

imaging camera uses an automatic shutter refresh technology. If you notice a brief image freeze (approximately 150ms) followed by normal operation, this is the shutter in action and is normal.

- The thermal imaging camera is equipped with a high-strength protective window and an automatic heating function for defrosting in low temperatures. If the protective window is damaged due to external impact, please visit a designated repair point as soon as possible to prevent damage to the internal components.

Driver Responsibility

- The "Night Vision System" is only intended to assist the driver with driving and warnings. The driver is fully responsible for all operations.
- The "Night Vision System" is only an auxiliary driving function and cannot handle all traffic, weather, and road conditions.
- Please use the system only when it is safe to do so.
- Our company is not responsible for any losses caused by improper use of the system or due to image recognition errors.

Features

- **Easy Installation:** The camera is miniaturized, with a minimum size of L52W30H26mm , and comes with universal mounting accessories for all vehicle types.
- **Thermal imaging resolution:** 256*192 / 384*288 / 640*512 optional.
- **Highly Integrated:** High-performance algorithm module and 5/7-inch display module are integrated into one unit.
- **Pedestrian detection:** Detects pedestrians at 80 – 100m (ambient temp 23±5°C).
- **Animal detection:** Max range 60m for animals over 1.7m tall.
- **Vehicle detection:** Max range 200m.
- **AI sensitivity:** Adjustable.
- **Touch function:** Supported.
- **False color modes:** White hot, black hot, iron red, warm, rainbow lava, red hot (7 modes).
- **Languages:** Simplified/Traditional Chinese, English, French, Russian, Korean, Arabic, Spanish, German, Japanese, Portuguese (10 languages).
- **Remote night vision:** Detects 300–500m ahead in total darkness.
- **Glare shielding:** Unaffected by high beams or strong glare; enhances driving safety.

- **Penetration function:** Effective through fog, smoke, dust, haze, glare, etc.
- **Zone warning:** 3-level customizable alert zones.
- **Alert output:** 3.3V signal output (synchronized with audible horn alert).
- **Recording:** Supports USB drive recording.
- **Startup video:** Customizable.
- **Logo on interface:** Customizable.
- **Alert voice:** Customizable.

Product Components





5/7-inch display unit (with built-in algorithm module)



Thermal imaging camera



Extension cable(5m)



Cigarette lighter power



Display unit mounting bracket

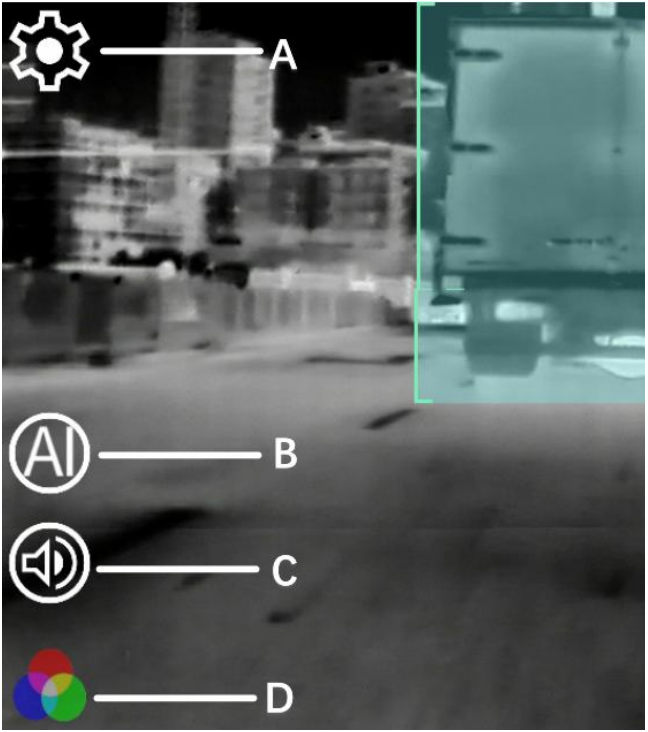


bracket

- The main unit must be powered through the cigarette lighter, and the cigarette lighter supports 12–24V voltage input.
- The camera is installed outside the vehicle (commonly installed at the grille).
- The main unit is installed at an appropriate location inside the vehicle.
- It is recommended to wrap the camera and cable connectors with waterproof tape to enhance waterproofing.
- Early warning parameters can be modified via the touchscreen.
- Cameras with different resolutions have the same appearance and installation accessories, and are installed and used in the same way.

- The main unit has a 3.3V alarm signal output, which is not necessary for non-professionals to use.

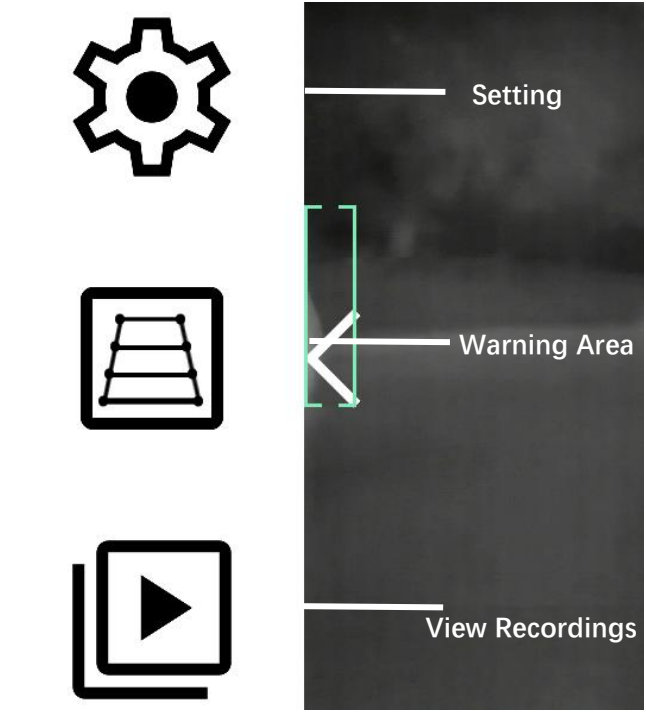
User Interface



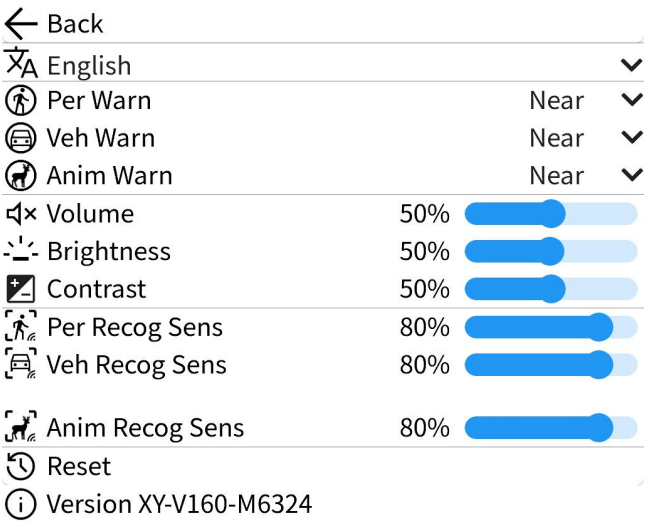
Tap the relevant icon to enter settings.

A Settings Menu

Open the settings menu to configure the system.



➢ **Tap to enter settings menu** :



Language: Switch between 10 languages — Simplified/Traditional Chinese, English, Russian, Arabic, German, French, Japanese, Korean, Spanish, Portuguese.

Pedestrian/Vehicle/Animal Alert: Select from Near / Medium / Far / Off.

Near: Alerts only for red warning zones.

Medium: Alerts for yellow and red zones.

Far: Alerts for red, yellow, and blue zones.

Alert urgency level varies by zone.

Volume: Adjusts alert volume.

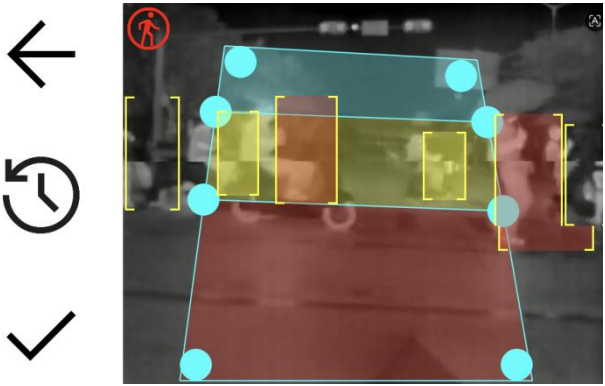
Brightness: Adjusts screen brightness.

Contrast: Adjusts thermal image contrast.

Pedestrian/Vehicle/Animal Detection Sensitivity: Higher values increase detection range but may cause false detections; lower values have the opposite effect.

Restore Default Settings: Resets the system to default parameters.

- **Tap to set alert zones. :**

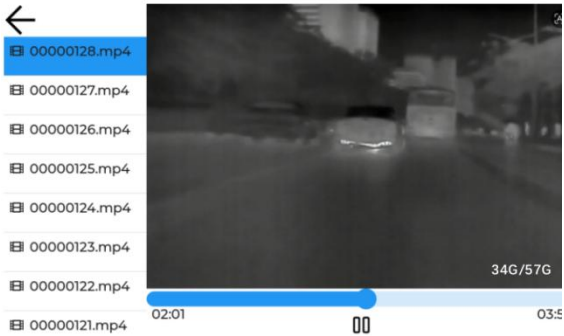


Drag the circles freely to adjust the warning zones, then tap when done.

Save Settings, Icon for restoring default settings., Done

Back。

➢ **Tap to view recordings. :**



Note: 34G/57G indicates used/total USB drive capacity.

B Disable AI

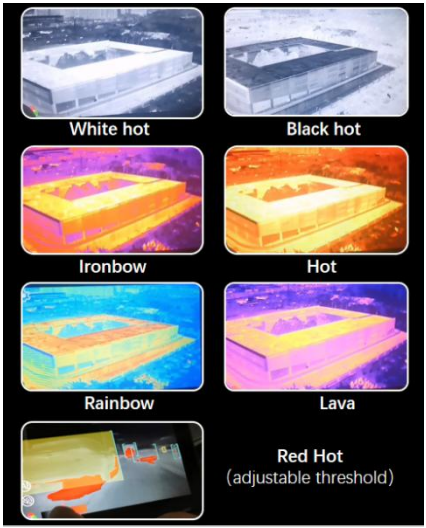
After tapping this icon, Change icon to , Disables all AI functions. Recognition boxes will disappear, and the alert horn will not work.

C Mute alert horn

After tapping this icon，Change icon to ，Disables the audible alert function. Recognition boxes on screen will remain.

D Palette switching

Tap the icon to cycle through thermal modes: White Hot (default), Black Hot, Ironbow, Hot, Rainbow, Lava, Red Hot.

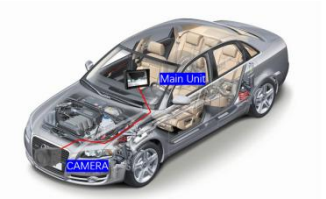


, If you see  , Adjustable thermal imaging contrast,  Restore default contrast。

Product Installation

Disclaimer: This product is a precision device. Proper installation is crucial for its performance. Please have it installed by a professional automotive repair shop.

Step 1: System Architecture

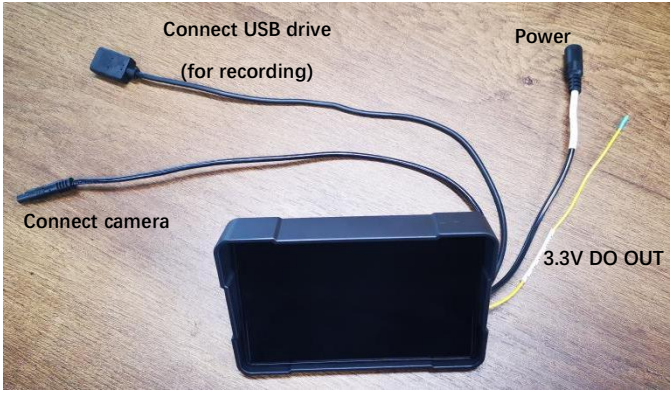


- The camera is mounted and fixed on the vehicle's front grille using a bracket.
- The cable is routed through the engine compartment into the passenger compartment.
- Install the display unit in a suitable location based on your needs.





Step 2: Display Unit Connection



Connection Diagram

- Main unit only needs to be connected to the voltage stabilizer power cable and the camera extension cable.
- The main unit can be mounted on the dashboard using a bracket, depending on the vehicle model.
- The 3.3V alarm output wire is for signal output only. It is recommended to connect it to a relay. Do not connect it directly to a load.

Step 3: Camera Installation Location

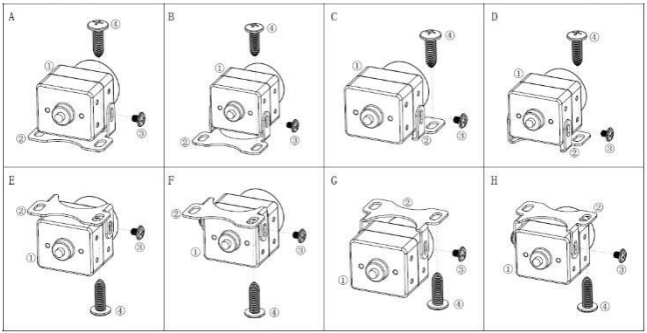


- Since far-infrared thermal radiation cannot penetrate glass, the camera must be installed outside the vehicle, inside the front bumper grille.
- Priority should be given to installing the camera in the upper part of the front bumper (Area 1).
- If Area 1 is too small for installation or completely closed (e.g., in some electric vehicles), install it in Area 2, the lower part of the front bumper.
- This installation method is suitable for all passenger and commercial vehicles.
- The camera does not need to be installed exactly in the center; position it as close to the center as possible based on the vehicle model.

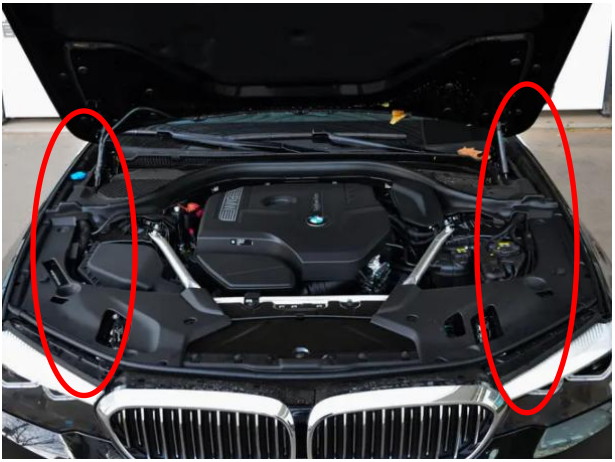
Step 4: Camera Installation



- The product is designed with a universal bracket for quick installation on various vehicle models.
- The camera has 8 mounting screw holes, allowing for different installation methods depending on the vehicle.



Step 5: Camera Cable Routing



- Typically, route the cable through the sides of the engine compartment and into the cabin via the A-pillar.
- The cable can be routed into the cabin for all vehicle models.
- The included cable is designed for automotive use, with high-temperature resistance, anti-aging, and double shielding for reliable performance.
- When routing the cable, avoid the engine block and follow the original vehicle wiring harness, securing it with zip ties.

Step 6: Powered via the cigarette lighter



- The accessory comes with a car cigarette lighter power adapter with a built-in fuse.
- Simply connect the DC plug of the cigarette lighter power adapter to the main unit's power connector.
- For most cars, the cigarette lighter automatically cuts off power after the car is locked, so it will not drain the battery. Please use it with confidence.
- If you insist on drawing power from another source, please install a dedicated automotive power supply and connect it to the main unit after stabilizing the output at 12V. Damage to the main unit caused by improper power use is not covered by the warranty.

Step 8: System Startup

- After completing the above steps, connect the cables as described in Step 2 and hide them neatly.
- The system will start automatically when the cigarette lighter is powered.
- The first startup takes approximately 18 seconds (including thermal imaging camera warm-up).
- The display unit will show the thermal imaging feed once the system is ready.



Step 9: Camera Angle Adjustment and Calibration





- The camera should be installed parallel to the ground, regardless of height, with the image vertically aligned.
- After proper installation, the horizon should appear in the middle of the image (as shown above).
- After calibration, secure the bracket with self-tapping screws.

After-Sales Service

This product series comes with a 3-month replacement warranty for non-human damage and a 2-year repair warranty. For discontinued, outdated, or discounted products, please refer to the company's official notice or written documents.

Product Specifications

Camera	Sensor type	12μm VOX
	Resolution	256×192/384*288/640*512
	Lens	Focal Length:: 9.1mm FOV ：
	FOV	18° * 13° (256)/29° * 22° (384)/45° * 37° (640)
	Defrost	support
	Image Display	Automatic shutter correction、White hot、≤50Hz
	Protection	IP67
	Size	L52 * W30 * H26mm
	Weight	60g
Display Unit	Screen	5/7-inch, 1024×600 resolution, IPS HD screen
	Power	≤5W（≤7W when heating）
	System	LINUX
	Startup Time	≤10S
	Identify type	Human/ Vehicle/ animal
	AI recognition	Human <100m； Vehicle <300m;animal<60m
	Recognition	Identification rate≥98 %;Real-time≥40 FPS
	Warning Method	Three-level visual and audible warnings (excluding
	Voltage	DC12-24V(powered via the cigarette lighter)
	Working TEMP	-30℃ - 70℃
	Size(mm)	L142*W38*H97(5-inch)/L180*W25*H120(7-inch)
	Weight	280g（5-inch）/ 420g（7-inch）