



User Manual for Vehicle-Mounted Infrared

N-Driver P102

Company Profile

WUHAN XUANYUAN IDRIVE TECHNOLOGY CO., LTD., relying on the military technology reserves of its parent company Guide Infrared, has realized the layout in the entire infrared industry chain. Characterized by self-research and production, and the safe and controllable core technology, the company is committed to applying the far-infrared technology to intelligent vehicles, thereby becoming an industry leader in the field of vehicle-mounted infrared thermal imaging. The main products of the company cover two categories: advanced driver assistance systems (ADAS) and smart cockpits. Among all the products, the vehicle-mounted thermal imaging intelligent driving system has achieved the world's leading technology level, supporting pedestrian and vehicle detection and recognition, alarms, and other functions. It can easily cope with complex road conditions such as darkness, haze, strong glare, etc., which greatly improves the vehicle's full-time perception capabilities, making it particularly suitable for night driving and intelligent driving.



GUIDE



Focus on infrared thermal imaging industry solutions



The expansion and popularization of infrared thermal imaging technology in the civilian sector



European branch, serving the markets of Europe and America



Mainly engaged in non-lethal police ammunition, after expansion, it has become a production, manufacturing, assembly and integration base for multiple types of missiles.



Mainly engaged in the research and development as well as sales of intelligent safety driving products



Focus on the fields of micro-electromechanical systems and sensing, and build R&D platforms, collaboration platforms and incubation platforms



01 A leading enterprise in infrared thermal imaging

- The largest infrared thermal imaging industrial park in Asia
- Market share of infrared thermal imaging ranking No. 1 in China and No. 2 in the world
- The first dual-color dual-band infrared detector in China, with world-leading key performance indicators



02 Military quality assurance

- An in-depth pilot unit for military-civilian integration program
- The first private company granted with second-level confidentiality qualification in Hubei Province
- China's first private company engaged in the overall research and development of weapon system



03 Core technology being independent and controllable

- Completely independent intellectual property rights, with more than 200 domestic and foreign patents
- Having a research and development base covering the entire infrared industry chain, from the bottom-level infrared core devices to the top-level complete optoelectronic systems



04 Multiple breakthroughs in intelligent driving projects

- Multiple intelligent driving application projects under trial production
- The first mass-produced infrared thermal imaging product for passenger cars and commercial vehicles in China
- Mature vehicle-mounted project import mechanism

technical strength

Core technology, independently controllable

An infrared detector batch production line with independent intellectual property rights; self-developed on-board infrared algorithms, industry-leading AI-ISP technology, AI super-resolution technology, segmentation rendering technology, and no-blocking algorithm technology, etc., have reached the industry-leading level, and the differentiated competitive advantages are remarkable.



Set industry standards

VEHIR was primarily responsible for formulating two national industry standards, namely "Passive Infrared Detection System for Automobiles" and "Performance Requirements and Test Methods for Passenger Vehicle Night Vision Systems". Over two hundred related patents were applied for, leading the application and promotion of vehicle infrared technology.



Vehicle-grade standards and quality system

Core components meet relevant standards such as AEC-Q. The new 8 μ m infrared detector chip has obtained AEC-Q100 certification. At the same time, the comprehensive introduction of the automotive quality management system compliant with IATF 16949 provides a systematic guarantee for the continuous high-quality delivery of products.



Mass production delivery capability

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Liability statement

This manual may not be copied, transmitted, transcribed, archived or translated into other languages and computer languages in any form or by any method (electronic, electromagnetic, optical or manual, etc.) without the permission of the Company.

This manual is compiled for the convenience of users to use and understand the products of our company. We will do our best to ensure the accuracy of the contents of this manual, but we still cannot guarantee the completeness of the contents of this manual. Since our products are updated and upgraded from time to time, the Company reserves the right to make changes to the manual at any time without prior notice.

Revision History

Rev.	Date	Remarks
V1.0	January 10, 2024	First issue

Thank you for your interest in our products. You are warmly advised to read the user manual carefully before use.

Hopefully this manual will help you use this product correctly.

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■ Product Introduction

N-Driver P102 is a cost-effective product specially developed for the special purpose vehicle market. Featuring a detector with 384×288 resolution, N-Driver P102 requires low power consumption, constructs in small size and supports CVBS analog video signal output and plug-and-play. Owing to its broader visual boundary in even the harshest weather environments, such as darkness, glare, smog, rain and snow, the product substantially reduces the probability of traffic accidents and enhances the capability of aided driving safety.

It can be used as an aftermarket installed product for auxiliary driving of off-road vehicles, special vehicles, mining vehicles, freight logistics vehicles, port and airport car ferry, and remote dispatching tractors. It provides waterproof and dustproof ability and supports flushing with running water.



Passive thermal imaging
Light-independent



Full-time, all-weather
perception Easily cope with the
harsh climate environment



IP69 dustproof and
waterproof Allow direct flushing
with running water



Analog video output
Plug and play



Intelligent defrosting
Automatic window heating



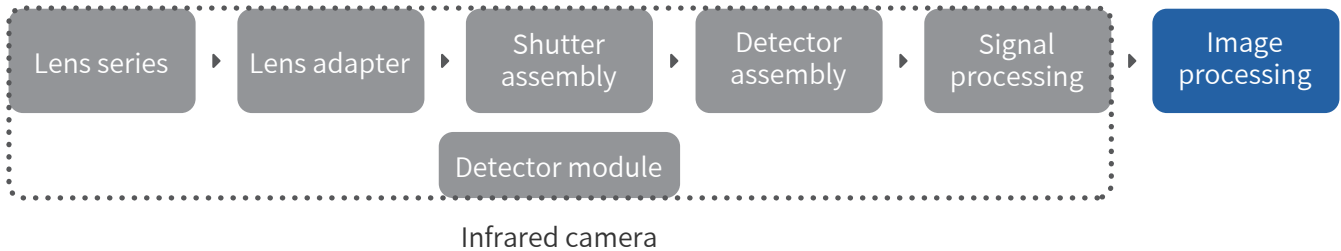
Segmented extension
line Easy installat

■ Product Specifications

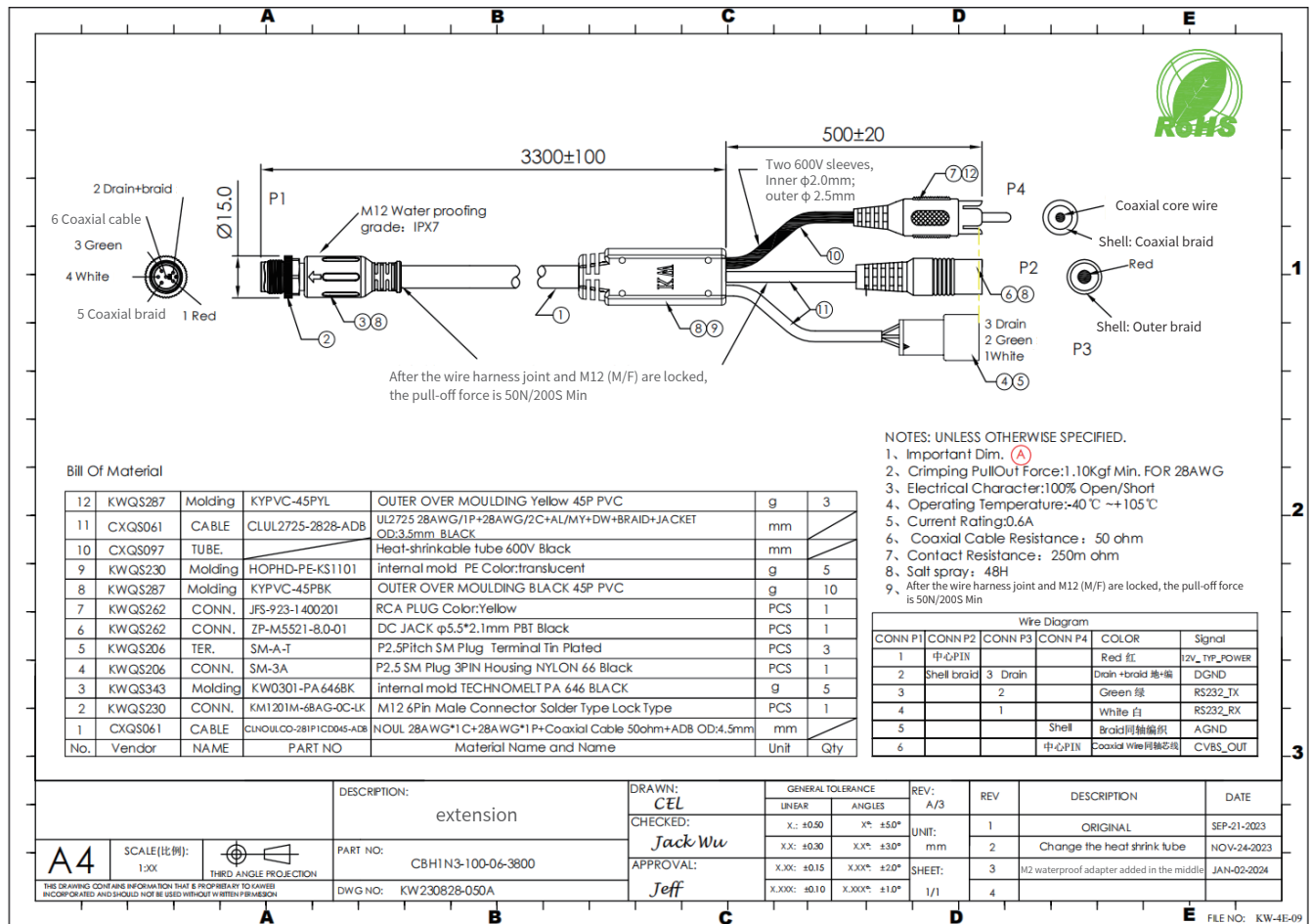
Infrared detector		
Detector type	Vanadium oxide infrared uncooled focal plane detector	
Response band	8~14 μm	
NETD	$\leq 60\text{mk}@25^{\circ}\text{C}$, F#1.0	
Detector area array	384 \times 288	
Image display performance		
Focal length	9.1mm	
Field of view (FOV)	42° \times 32°	
Spatial resolution	1.86mrad	
Video output interface	RCA jack adapter	
Video output format	Analog video CVBS	
Video output resolution	PLA@720 \times 576	
	NTSC@720 \times 480	
Detection range	Pedestrian: 1.8m \times 0.5m	Large family car: 2.3 m \times 2.3 m
	$\geq 150\text{m}$	$\geq 350\text{m}$
System characteristics		
Rated voltage	DC9~32V (typical 12V)	
Overall power consumption	$\leq 1\text{W}$ @(12V power supply, window heating not activated)	
	$\leq 5\text{W}$ @(12V power supply, window heating activated)	
Imaging start time	$\leq 3.5\text{s}$ (normal temperature)	
Automatic heating function	When the window temperature is lower than $2^{\circ}\text{C} \pm 2^{\circ}\text{C}$, the intelligent heating function will start automatically	
Shutter	Automatic shutter compensation	
Image algorithm	3D noise reduction RAW	
	Image enhancement	
Physical properties		
Camera size	28 \times 28 \times 50 mm	
Camera weight	$\leq 120\text{g}$	
Camera IP grade	IP69	
Environmental parameters		
Operating temperature	$-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$	
Storage temperature	$-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$	
Environmental reliability	GB/T 28046.4-2011/GB/T 30038-2013	
Mechanical property	GB/T 28046.3-2011/ISO 20567-1	
Electrical property	GB/T 28046.2-2019	

Hardware Description

01 Infrared Camera Block Diagram

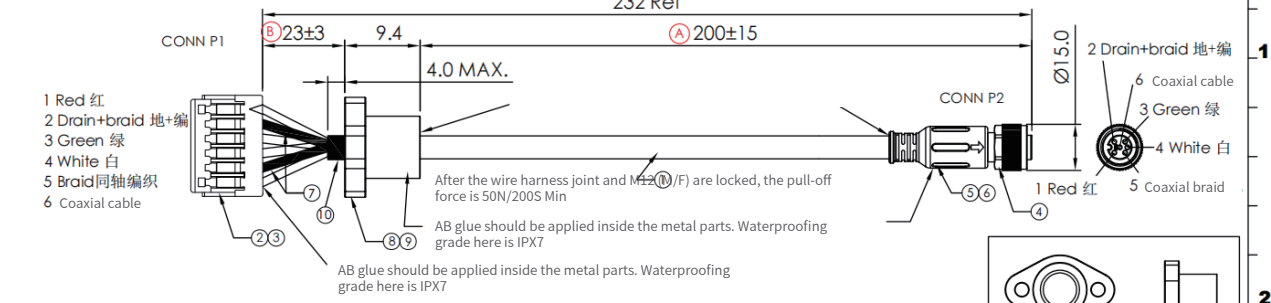


02 Harness Definition Diagram





- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1、Important Dim. (A) (B)
 - 2、Crimping PullOut Force:1.10Kgf Min. FOR 28AWG
 - 3、Electrical Character:100% Open/Short
 - 4、Operating Temperature:-40℃ ~+105℃
 - 5、Current Rating:0.6A
 - 6、Coaxial Cable Resistance: 50 ohm
 - 7、Contact Resistance: 250m ohm
 - 8、Salt spray: 48H
 - 9、After the wire harness joint and M12 (M/F) are locked, the pull-off force is 50N/200S Min



Bill Of Material

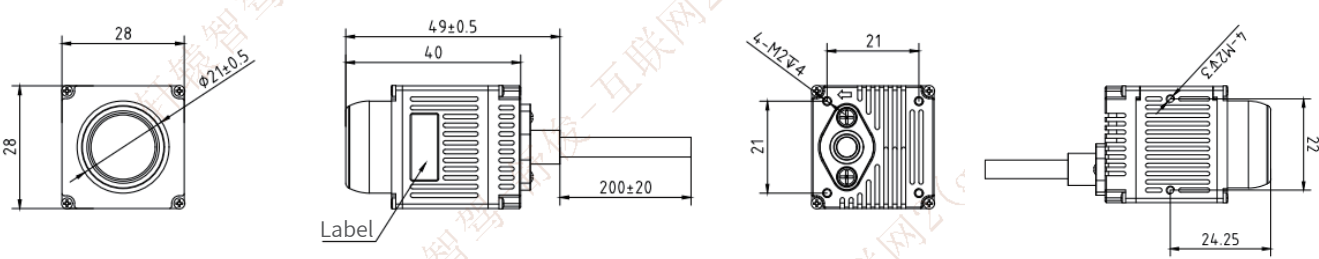
No.	Vendor	NAME	PART NO	Material Name and Name	Unit	Qty
10	CXQS097	TUBE.		Heat-shrinkable tube 600V Black	mm	
9	KWQS287	O-Ring		O-Ring OD:5.0mm*ID10.0mm* 1.0mm WHITE SILICONE RUBBER	PCS	1
8	KWQS388	Metal	KW0309-JGXH03A-0027	Metal firmware : SUS316 Passivation, Natural		1
7	CXQS097	TUBE.		Heat-shrinkable tube 600V Black		
6	KWQS262	Molding	KYPVC-45PBK	OUTER OVER MOULDING BLACK 45P PVC	g	10
5	KWQS343	Molding	KW0301-PA646BK	Internal mold TECHNOMELT PA 646 BLACK	g	5
4	KWQS206	CONN.	KM1201F-6BAG-0C-LK	M12 6Pin Female Connector Solder Type Lock Type	PCS	1
3	KWQS230	TER.	11002TOP-2E-S-NK	PH1.0 Phosphor Bronze, Tin Plating	PCS	6
2	KWQS230	CONN.	11002H00-6P-HF	1.0 mm SH Housing 6P Without protrusions	PCS	1
1	CXQS061	CABLE	CLNOULCO-28IP1CD045-ADB	NOUL 28AWG*1C+28AWG*1P+Coaxial Cable 50ohm+ADB OD:4.5mm	mm	

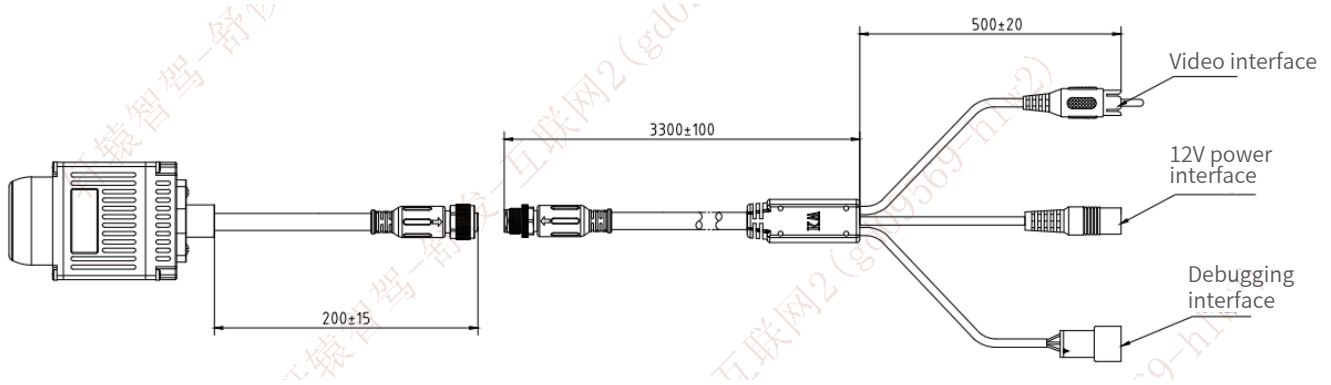
Wire Diagram			
CONN P1	CONN P2	COLOR	Signal
1	1	Red 红	12V_TYP_POWER
2	2	Drain +braided 地+编	DGND
3	3	Green 绿	RS232_TX
4	4	White 白	RS232_RX
5	5	Coaxial braid	AGND
6	6	Coaxial Wire 同轴芯线	CVBS_OUT

A4	SCALE (比例): 1:XX	THIRD ANGLE PROJECTION	DESCRIPTION:	DRAWN:	GENERAL TOLERANCE		REV:	DATE	
			PART NO: CBH1N3-100-06-232	DWG NO: KW230828-050B	CEL	LINEAR	ANGLES		A/3
					Jack Wu	X.: ±0.50	°: ±5.0°		UNIT:
					Jeff	X.X: ±0.30	X.X°: ±3.0°		mm
				APPROVAL:	X.XX: ±0.15	X.XX°: ±2.0°	SHEET:		
					X.XXX: ±0.10	X.XXX°: ±1.0°	1/1		

Tail harness

03 Structure & Dimension Diagram





Product Function Highlights

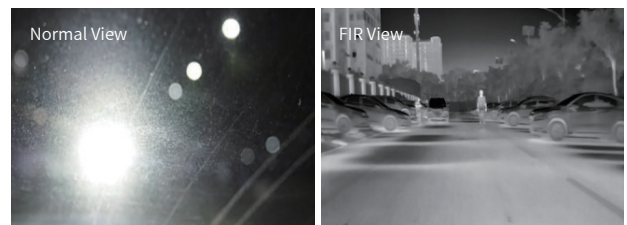
ALL-Day Operation & Enhanced Night Vision Function

The infrared image of the system allows breaking through the night barrier, all-weather use and a broader driver's vision. It solves the problem of limited driving vision at night.



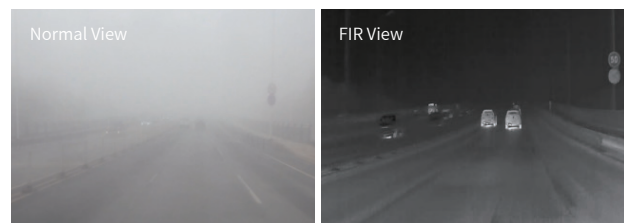
Anti-Glare Function

Because the infrared image of the system is not affected by light changes, the driver is less affected by glare and light mutation when driving. It solves the problems of glare of traffic at night and sudden change of light entering and leaving the tunnel.



Fog, Smog & Dust Penetration Function

The infrared image of the system ensures clear imaging in heavy fog, foggy, hazy and dusty weather, and expands the driver's driving vision in bad weather.

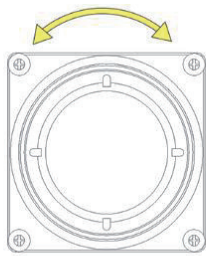


■ Installation Instructions

Before you use this infrared intelligent driving system, please carefully read the following installation procedures to ensure the normal use of the product.

Step 1

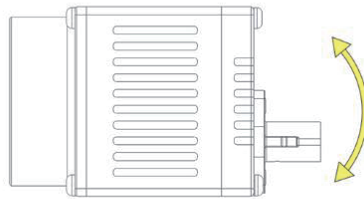
Design and install the bracket according to the actual situation of the vehicle



Roll error : < 3 degree

Step 2

The infrared camera is recommended to be installed at a suitable position on the front grille of the vehicle and as far away from the radiator tank and speakers as possible



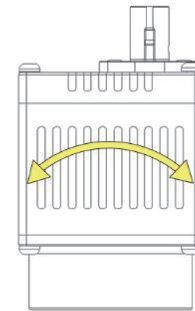
Pitch pointing error : < 3 degree

Step 3

The installation height of the infrared camera ranges from 40 cm to 120 cm (depending on the height of the vehicle)

Step 4

See the figure below for installation angle requirements (practical example)



Yaw pointing error : < 3 degree

■ Troubleshooting

01 No Video Image

- Verify that the power cord is securely connected.
- Verify that the video cable is securely connected.

02 Lines or Ghosts on Image

Verify whether the image is frozen or whether you hear the "click" sound from the vehicle-mounted infrared thermal imaging camera. If you neither see image freeze nor hear the "click" sound (it may take a few minutes later), the built-in camera shutter may fail, please repair it at an authorized maintenance point.

03 Image Jittering

Check your mounting bracket to make sure your bracket is installed firmly and securely.

04 Dark View

Check whether your video cable is well connected. If it is damaged, please contact the supplier or consult us for maintenance advice.

■ Daily Use & Maintenance

In order to maximize and ensure your safe driving experience, and maintain a normal system for high-quality assisted driving services, please follow the precautions below:

01

Make sure the system is well installed before use. If you intend to use this product for a long time, please check it regularly and make sure the system is firmly installed and not sheltered by foreign objects.

02

Make sure the system works within the specified voltage and temperature ranges. Do not turn on and off the machine power frequently. The restart interval after shutdown shall not be less than 30 seconds.

04

In order to enhance the imaging quality, the lens surface of this system is coated with an antireflection film. Do not touch the lens surface directly with your hands, because the acidic substances left by your fingerprints will damage the coating and lens surface. Please wipe the lens with special lens cloth or glasses cloth when cleaning is needed.

Friendly Reminder

01

The vehicle-mounted infrared thermal imaging camera is fully sealed and waterproof.

02

Do not disassemble the product by yourself. We do not provide warranty for product failure or damage attributing to user's unauthorized disassembly.

03

In case of product failure, you can contact the supplier in time or consult us for maintenance advice.



One-stop service worry-free throughout the process

The professional after-sales service team adheres to the concept of "Night vision has no boundaries, service is worry-free", continuously innovating the service model and enhancing professionalism, providing customers with more professional, convenient and efficient service experiences.



Quick Response Satisfaction Directly Achieved

To better serve our customers, we implement the 8137 rapid response policy. We respond within 8 hours of the request, provide a preliminary analysis within 1 working day, offer an effective solution within 3 working days, and complete the repair within 7 working days to ensure customer satisfaction.



VEHIR Premium Selection Quality Guaranteed

We strictly control the product quality and always provide customers with 100% genuine original factory parts, ensuring that the quality and functions are consistent with those of the original products, thus making customers feel more at ease and assured.

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