VAR300

User Manual

V1.1

Reading Tips

This manual applies to the active photoelectric detection device developed and produced by the company. The manual provides comprehensive specifications, functional design, structure and specification requirements of the system, as well as installation, deployment, and operational requirements, serving as an operational guide for end users.

Symbol Legend

	Supplementary Notes: Additional explanations and annotations to the main text of the manual.
	Safety Notices: Important operational warnings and risk prevention guidelines for users.
	DANGER: Indicates imminent hazards which, if not avoided, will result in death or serious injury and major property damage.

Manual Usage Recommendations

1. Before using the product, please read this manual thoroughly. Retain this manual for future reference to address any operational inquiries.
2. All photographs, graphics, charts, and illustrations in this manual are for explanatory purposes only and may differ from the actual product. Refer to the physical product for exact specifications. The company reserves the right to update this manual due to product version upgrades or other requirements, with the latest electronic version to be distributed to users.
3. The company recommends using this manual under the guidance of qualified personnel.

Safety Notice

Before using the product, please carefully read the following precautions and operate the product correctly as required.

Installation Precautions

Environmental Requirements

Do not install or store the product in any of the following locations:

- Extreme environments: places where temperatures exceed the range of -20°C～+60°C or where frost may form.
- Near strong electromagnetic interference sources or equipment with large current fluctuations.
- Areas with flammable, explosive, corrosive gases or dust.
- Damp or water-exposed areas. Liquid ingress may cause electric shock or fire hazards.

Operational Guidelines

- Only qualified personnel or designated maintenance staff may open the chassis.
- All antennas must be fully connected and tightened according to the labels. Powering on the device without antennas installed is strictly prohibited.

Usage Precautions

Power and Electrical Safety

- Use only the specified AC 110 V–220 V power supply.
- Do not pull or bend the power cord. Avoid crushing or twisting it, and stop using it if damaged.
- Do not operate the equipment during thunderstorms. Avoid touching power lines or device connectors during lightning to prevent electric shock.
- Always unplug the power cord before moving the device.

- Do not touch the power plug with wet hands.
- When unplugging the power cord, hold the plug body firmly.

Operational Risk Warnings

- If abnormal conditions such as smoke, unusual noises, or burning smells occur, shut off power immediately and contact our after-sales service department.
- Do not install any software unrelated to the software platform; system issues caused by such software are not covered under warranty.
- Do not connect unauthorized USB drives or external hard drives to avoid malware infection. Do not delete server files arbitrarily, change the system time, or shut down or restart the server without authorization.
- Unauthorized personnel are prohibited from disassembling the device to avoid damaging internal components or compromising your rights. If the device malfunctions during use, contact our after-sales service department.

Regulatory Compliance

- This device may cause radio interference during operation. Users must take feasible measures to mitigate such interference.
- If suspected interference occurs with civil-aviation or military frequencies, stop using the device immediately, investigate the cause, and report the incident.

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1 Product Introduction

VAR300 is a stationary high-performance multi-integrated active photoelectric detection device that adopts multi-spectrum and multi-technology fusion design. It makes full use of deep neural network algorithms to automatically extract and classify features from image data to improve the accuracy and effectiveness of detection and identification of "low, slow and small" drones.

1.1 Main Functions

Automatic Tracking

Record the flight path and image information of the drone, providing evidence for subsequent processing and completing the entire process of closed-loop disposal.

Multi-spectral Detection

Integrate visible light and infrared thermal imaging technologies to realize all-weather detection (applicable to all day, all weather).

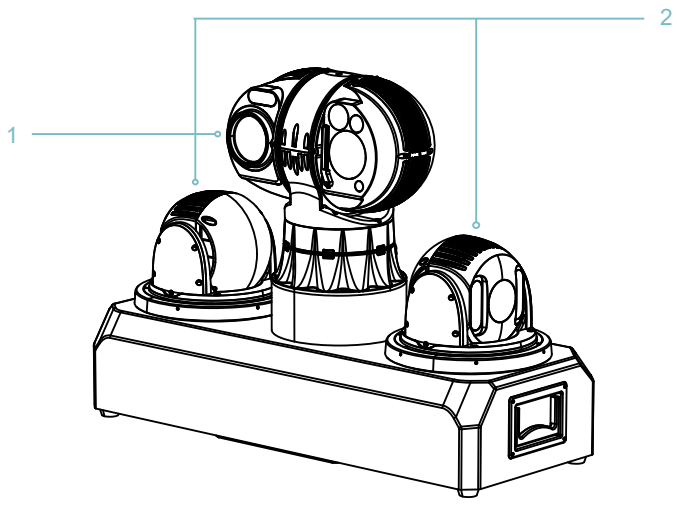
Intelligent Identification

Long-range small target algorithm based on high-resolution camera module and AI vision deep learning, applicable to low-altitude target detection and identification.

Target Localization

Automatically locks on to the target after detecting a drone, and displays information such as the number and Geo-location.

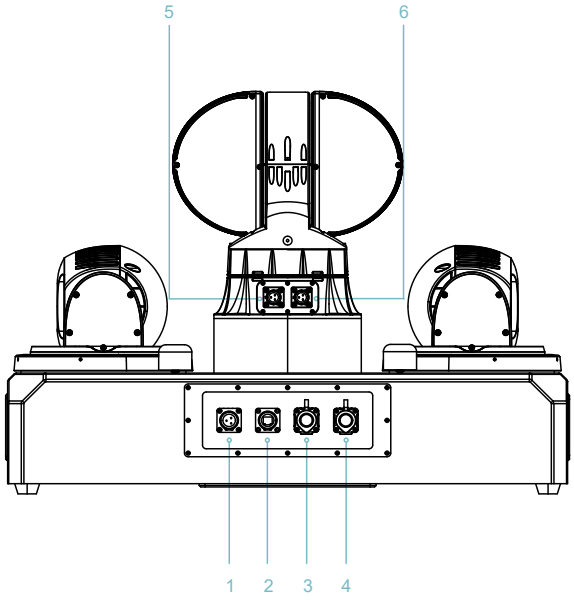
1.2 Product Appearance



1. Narrow Camera for recognition and tracking

2. Wide Camera for scanning and searching

1.3 Device Interface

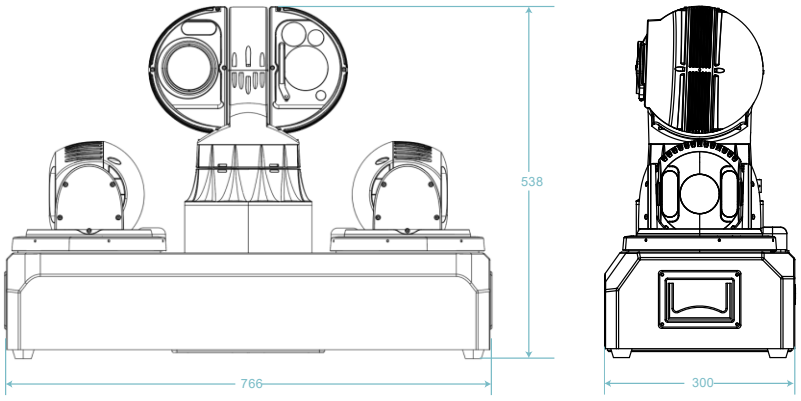


Position	Description	Label	Interface Type
1	Camera Power Interface 1		2-pin circular aviation connector
2	Camera Ethernet Port 1		12-pin circular aviation connector
3	Device Ethernet Port		RJ45
4	Device Power Interface		AC110V～240V power input
5	Camera Power Interface 2	-	2-pin circular aviation connector
6	Camera Ethernet Port 2	-	12-pin circular aviation connector

1.4 Mechanical Characteristics

Item	Specification
Size(1)	
Length	766mm
Width	300mm
Height	538mm
Weight	
Weight	37kg

(1) The data are of the main unit, exclude tripod. Device dimensions are shown below (unit: millimeters):



2 Equipment Deployment Preparation

Choose a wide-view area to erect the device. First check the specifications and quantity of all parts and standard parts according to the equipment list, and then assemble them step by step according to the following installation steps.

2.1 Site Selection

The equipment is typically deployed outdoors. A comprehensive site survey must be conducted prior to installation and deployment. Site the equipment should pay attention to the following factors:

Visibility environment: Choose a flat, open highland or building rooftop, ensuring a 360° unobstructed view for the antenna placement.

Electromagnetic environment: Avoid electromagnetic interference zones such as microwave stations, radio transmission towers, and high-voltage power line crossings, as well as areas near glass curtain wall clusters and large metal structures (e.g., bridges, transmission towers).

Natural environment:

- Avoid the wind to reduce the equipment antenna wind load.
- When deploying in thunderstorm-prone areas, avoid locations susceptible to water accumulation and lightning strikes. Install a lightning rod for protection; its height must exceed the overall equipment height by at least 50 cm.

Electrical Environment: Avoid areas near electrified railways, base stations, or any other sources prone to signal interference.

Infrastructure: Ensure the site has mains power access and supports connection to public or dedicated communication networks.

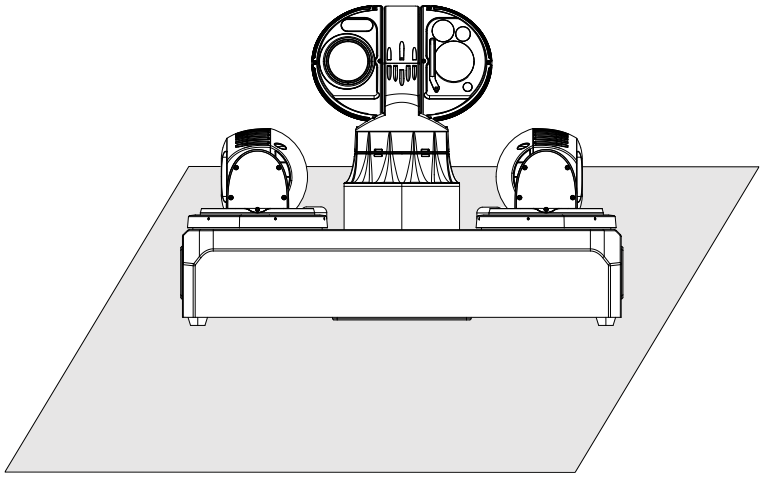
Additional Requirements: The deployment site must be legally designated for construction. The building structure or mounting bracket must have sufficient load-bearing capacity to meet the equipment’s weight requirements.

2.2 Installation Methods

The device features an all-in-one design that requires no manual assembly. It supports two installation methods: placement on a flat surface or mounting on a tripod.

Placement on a flat surface

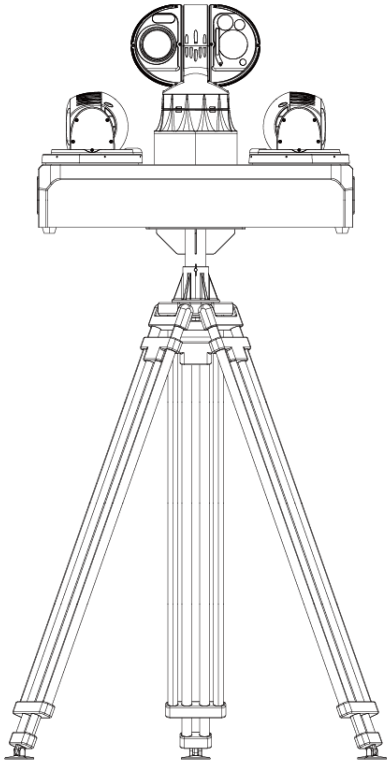
Place the device on a flat and stable surface capable of supporting its weight.



Mounting on a tripod

The device is equipped with a detachable support bracket at the bottom. Secure the bracket to the device using bolts, then mount the entire assembly onto a tripod. Ensure the tripod is placed steadily on the ground.

ⓘ	For long-term use, anchor the tripod to the ground using expansion bolts or add counterweights at the base to prevent tipping.



2.3 Delivery Checklist

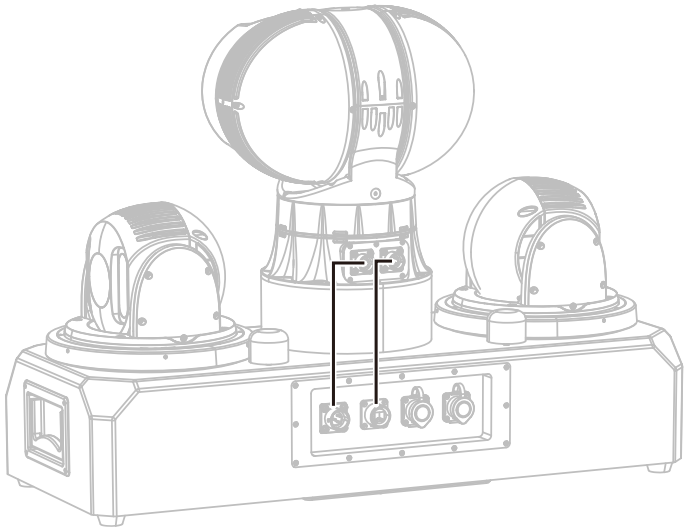
Check the specifications and quantity of all parts and standard parts according to the equipment delivery list.

Part	Quantity	Description
Main Unit	1	Active optoelectronic detection device
Industrial PC	1	Data processing and control core
IPC Cabinet	1	Protective enclosure with waterproof, moisture-proof, and dustproof functions to ensure stable operation
Ethernet Cable	2	5m standard Ethernet cables
Power Cable	2	220V AC power cables
Tripod	1	Height-adjustable tripod for mounting the main unit

3 Deploy the Equipment

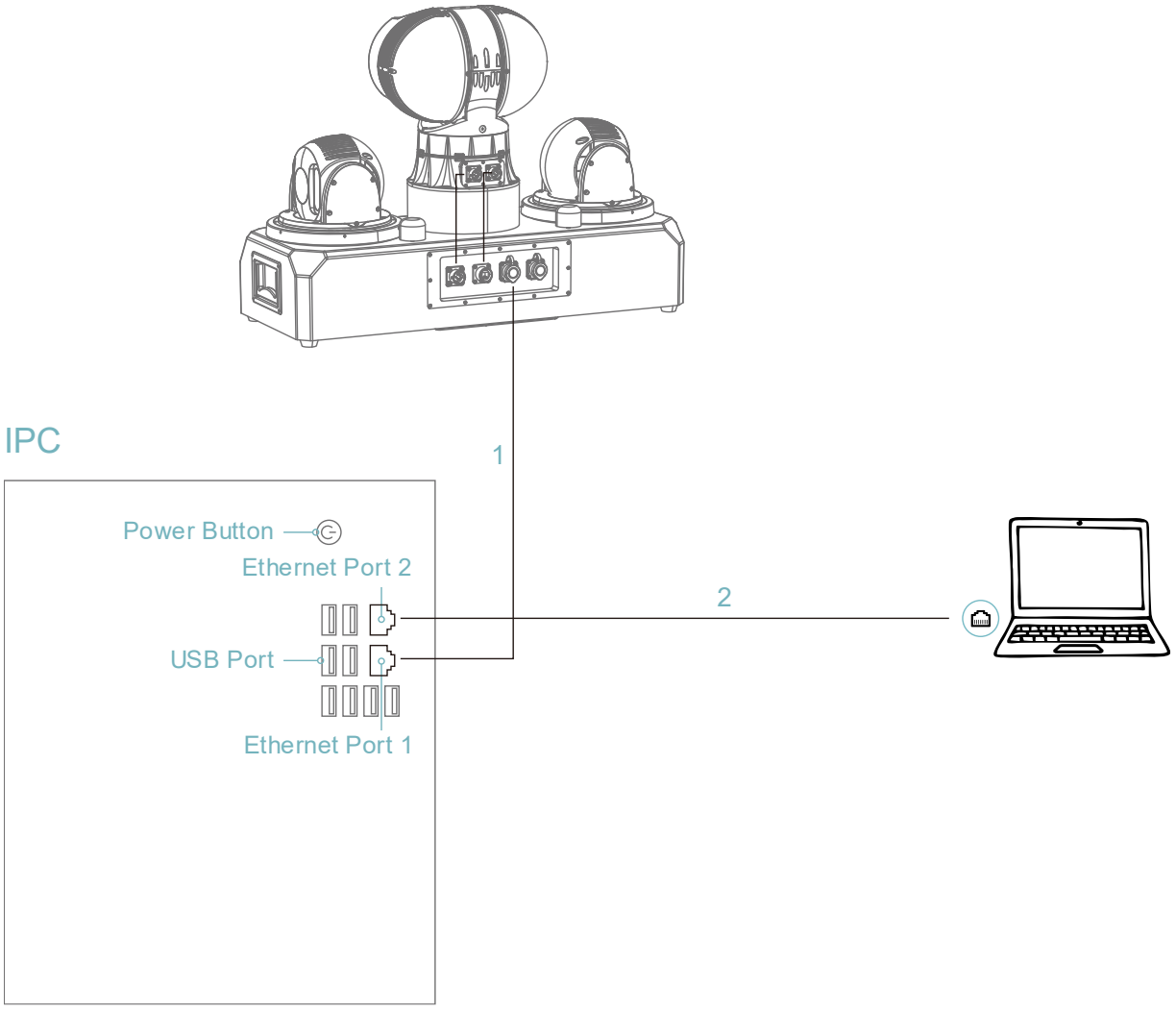
3.1 Connect Camera Interfaces

1. Connect Camera Power Interface 1 and Camera Power Interface 2 using the power cable.
2. Connect Camera Ethernet Port 1 and Camera Ethernet Port 2 using the Ethernet cable.



3.2 Connect to the Network

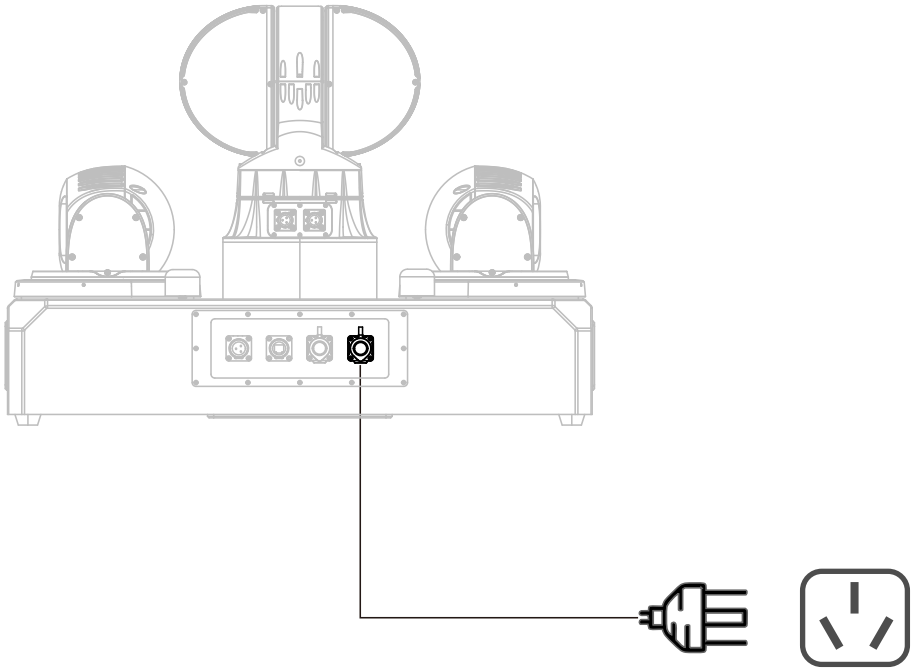
1. Connect the Device Ethernet port to the IPC’s Ethernet port 1 using an Ethernet cable.
2. Connect the IPC’s Ethernet port 2 to the control terminal’s Ethernet port using an Ethernet cable.



For networking, use the switch.

3.3 Connect Power Supply

1. Connect the input end of the power cord to the fixed power supply and insert the output end into the Device Power Interface.



4 Drone Defense Software Platform

Drone defense software platform, which integrates situational awareness, information display, decision-making assistance, command and control. It supports browser access and control of other devices on the LAN, and supports multi-screen and multi-device monitoring.

4.1 Log in to the System

Configure the Network

Before logging into the system, it is necessary to configure the network settings of the drone defense software platform. The IP address should be set within the 192.168.100.x subnet, which is the same subnet as the default access IP of the system: 192.168.100.103.

1. Configure the IP subnet to 192.168.100.x according to the system platform, e.g., Windows, Linux, or macOS.

ⓘ	Avoid setting the IP address to 192.168.100.103, as this will cause a conflict.

Log in to the System

1. Open a browser and enter the device's IP address https://192.168.100.103 to access the login page.

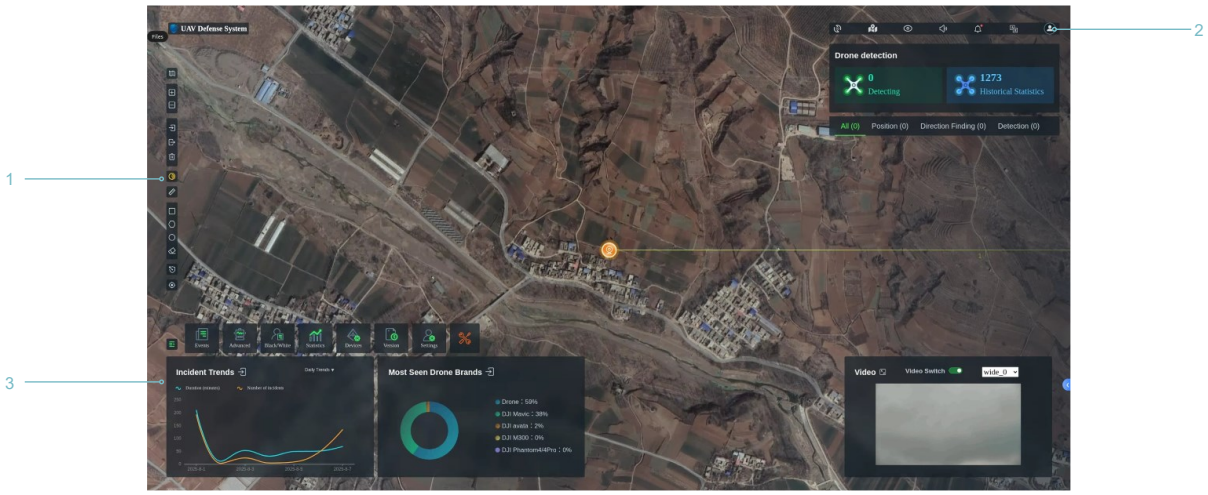
💡	Google Chrome is recommended for use.

2. Enter the system account and password, drag the verification slider to verify, and then click the “Sign in” to enter the main interface of the system.

Account:	admin
Password:	admin

4.2 Main Interface

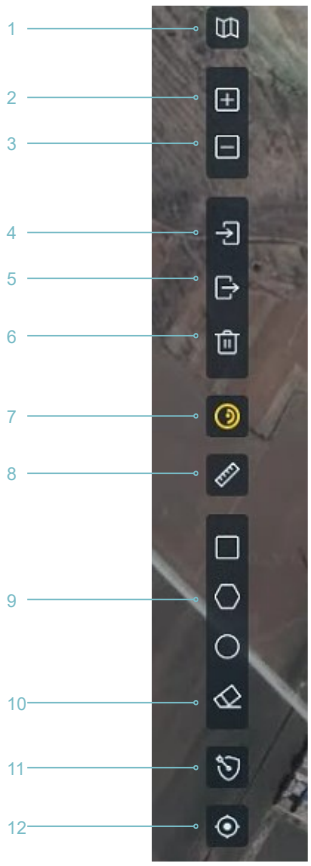
The main interface is distributed in three functional areas.



1. Operation menu area
2. Information display area
3. Function display area

Operation Menu Area

The operation menu area includes options such as map mode switch and defense-zone settings.



1	Map mode switch	Switch between Google satellite and Google vector.
2	Zoom In	Zoom In the map.
3	Zoom Out	Zoom Out the map.
4	Import map	Import offline map files into the system. When the network disconnected, it will automatically switch to the loaded offline maps. The offline map file must be named and formatted as **mapTiles.db**.
5	Export map	Export the offline map files that have been imported into the system. View the exported map files in the browser's download list.
6	Clear offline map files	Delete the imported offline map files.
7	Set center point	Sets the center point coordinates for networking. Not applicable for single-device operation.

8 Measuring distance	Measure the distance and angle between two points on the map, allowing for the measurement of distances and angles between multiple endpoint positions and a starting point.
9 Draw defense zone or warning zone	Set Defense Zone/Warning Zone on the Map. **Defense Zone:** Once set, the defense zone appears as a red inner circle. If a drone enters this zone, it will be highlighted in orange, and audible/visual alarms will activate. **Warning Zone:** Once set, the warning zone appears as a blue inner circle. If a drone enters this zone, it will be highlighted in orange, and audible/visual alarms will activate. Unauthorized drones entering the warning zone will trigger continuous alerts while their position and flight path are monitored. The minimum allowable area for drawing defense/warning zones is 100 square meters.
10 Eraser Defense Zone	Delete the defense zone or warning zone drawn on the map.
11 Locate the air defense zone	If the device moves too far and loses the defense/warning zone, perform rapid repositioning.
12 Return to center	Return to the center point.

Information Display Area

The information display area includes options such as hiding/displaying the menu bar of the main interface, volume, notification switch, language switch, system logon/logoff and other operations.

In addition, this area is mainly responsible for the real-time detection information display and control functions of drones, which can display the number of current detection and historical detection drones, as well as the detailed information of currently detected drones.

1 3D Map	Switch between 3D map view and 2D map view.
2 Historical Drones Detection Setting	Display the historical drone-detection locations on the map and marked with yellow. The date range can be configured by start time and end time.
3 Hide/Show panel	Hide or show the detection area, function area, and map area of the interface.
4 Sound settings	Adjust the alarm volume.
5 Notifications	Display device status notifications.
6 Change language	Change system language.
7 Account login	Account login/logout.

Function Display Area

The function display area includes options such as checking the events, checking the whitelist, checking the statistic, checking the device status and other operations.

Click the button to expand the function display area menu. Click the same button again to hide the menu.

1 Events	The Drone Events list shows drone details such as type, ID, detection time, duration, and frequency. It supports sorting, time-based expansion, history replay, export drone events, clear drone events on the main screen.

2 Advanced	Includes the unknown UAV WiFi detection, Custom Detectors, Custom Models module.
3 Black/White	Drones added to the blacklist will be flagged with an alert once they enter the defense zone. Drones on the whitelist will not trigger any alarm when they enter defense zone. Whitelist/blacklist exports are saved in UTF-8 format. View the exported files in the browser's Downloads list.
4 Statistics	The Drone Statistical Report includes Incidents/Drones, Most Seen Drone Brands, Common UAV, Incident Trends and Critical Incidents. It supports date range configured by start time and end time, and export PDF of the statistics.
5 Devices	The device management window displays the operational status information of controller, engine and sensors. ● Controller: Display the information such as operation status, and detection bands. ● Engine: Display the information such as operation status, GPU and CPU information, and version. ● Sensors: Display the information such as operation status, detection bands, and version of the two sensors.
6 Version	Display the version information of UI version, cm, engine, sensor.
7 Settings	Modify passwords and do user management, such as add, edit and delete.
8 Fault Indication	Device fault indication.
9 Function display area	The functional display area primarily shows the Spectrum, Incident Trends, Most Seen Drone Brands and Video.

4.3 Check Detection Information

When a drone is detected, the system triggers an automatic alarm.

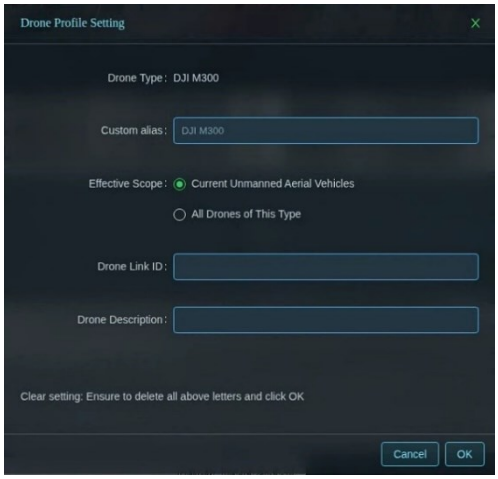
1. View the detected drone model information on the main interface, while an intrusion

alert message pops up at the top of the screen.

2. In Information Display Area, it displays the position and direction of the drone, the drone model, electronic ID and approximate location information. It also supports actions such as viewing and setting the drone's profile, marking it as a false alarm, or initiating visual tracking.

Set Drone Profile

1. Select a drone. Click button and select **Profile**.
2. On the Drone Profile Setting page, configure the Custom alias, Effective scope, Drone Link ID, and Drone Description.

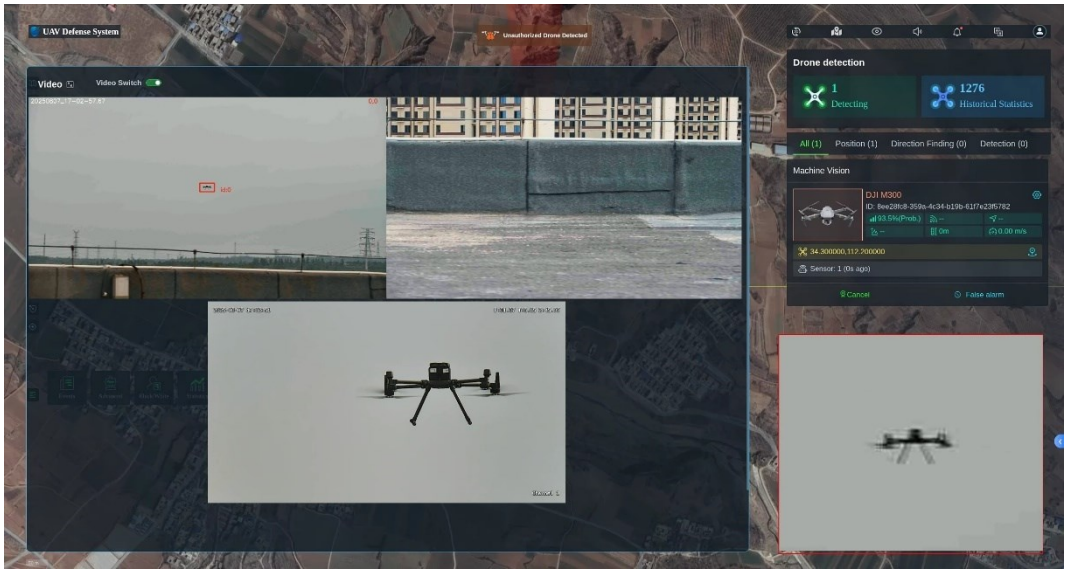


4.4 View the Real-Time Video

The Video located at the lower-right of the main interface, can be expanded for full viewing. During detection, the device follows preset horizontal and tilt angles to capture environmental video; the main unit performs 360° horizontal omnidirectional detection.

1. View the real-Time video at the lower-right of the main interface.

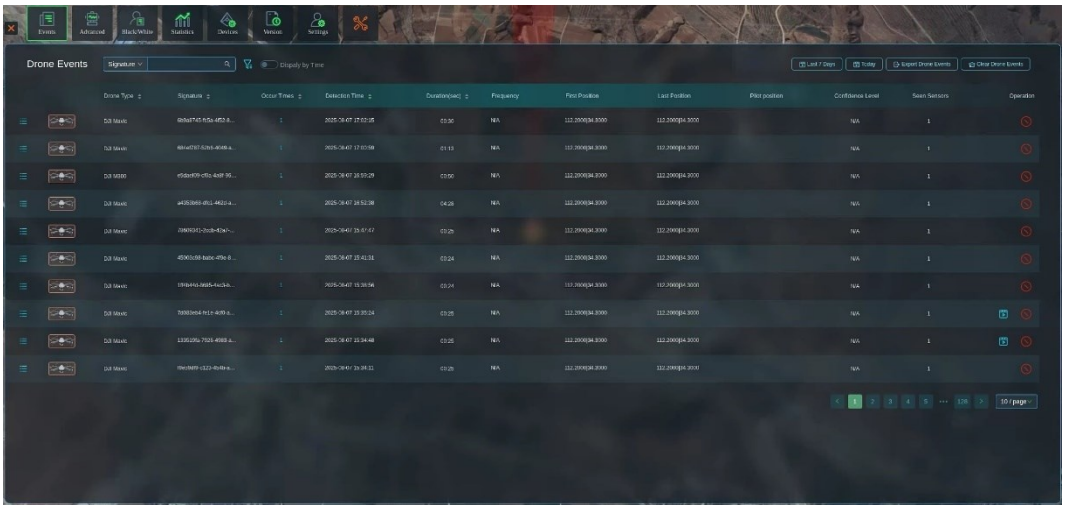
2. Click ⛶ to expand the real-time detection view and check it.



4.5 Check the Events

1. In Function Display area, click **Events**, view the drone events.

This feature allows one-click expand/collapse of the “Incident Trends” panel on the main interface.



2. Click **Export Drone Events** button to export drone events.

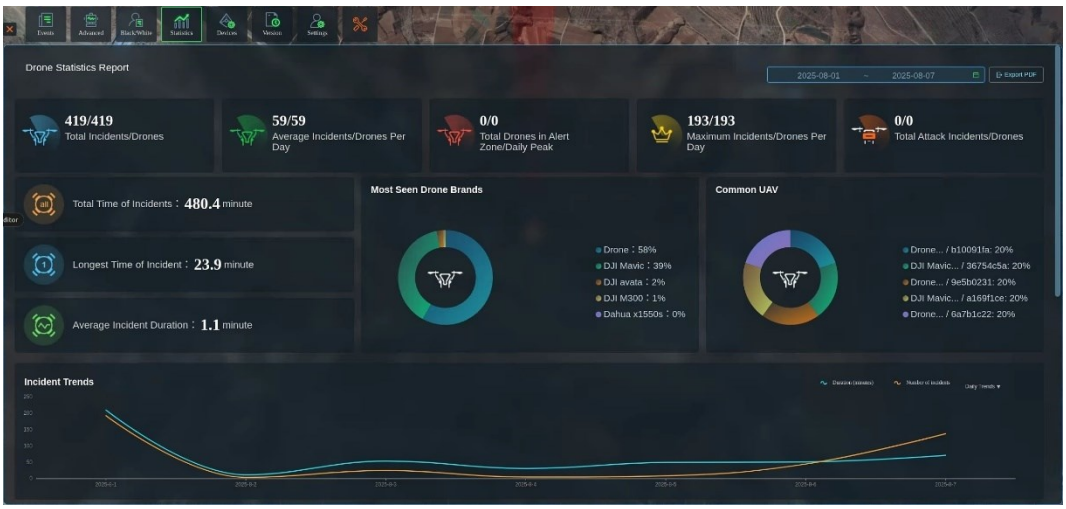
4.6 Manage the Whitelist/Blacklist

The Whitelist/Blacklist function is realized by detecting and identifying the drone's unique ID. It is available when the VAR300 device operates in a networked configuration with radio frequency equipment.

4.7 Check the Statistic Report

1. In Function Display area, click **Statistics**. View the drone event statistics report.

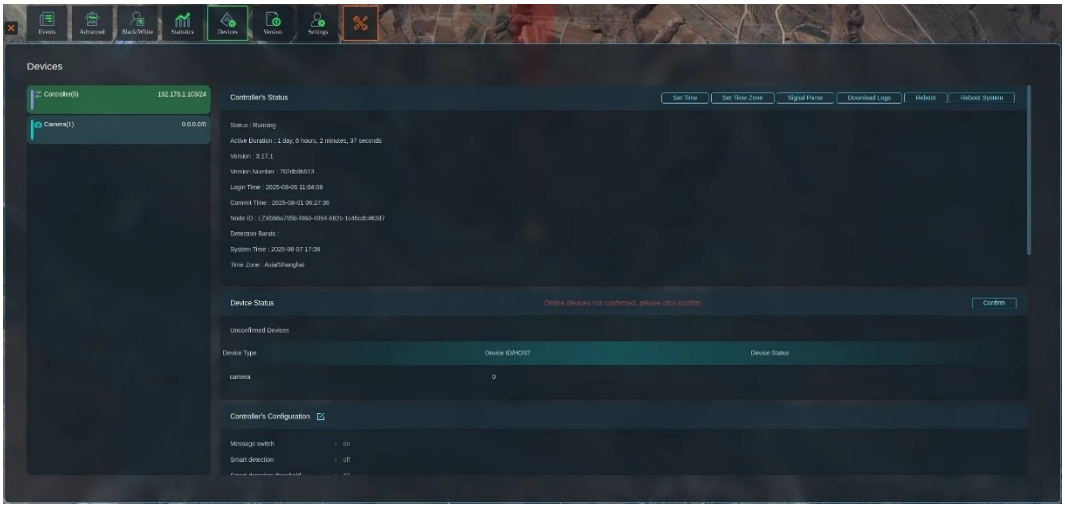
This feature allows one-click expand/collapse of the "Most Seen Drone Brands" panel on the main interface.



2. Click **Export PDF**, set the time range and export the statistical report in PDF format.

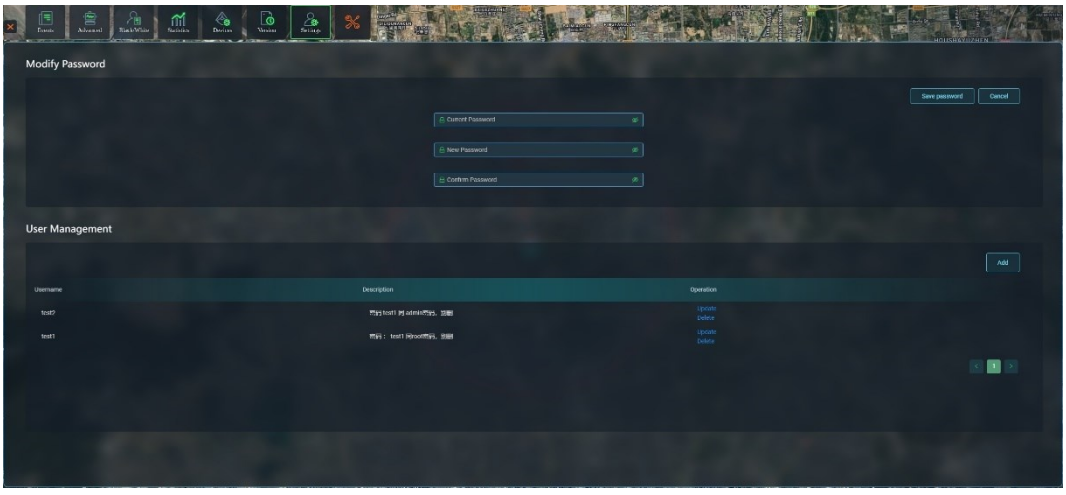
4.8 Check the Device Status

1. In Function Display area, click **Devices**. View the information of Controller, Engine, and Sensors.



4.9 Change Password

1. In Function Display area, click **Settings**.



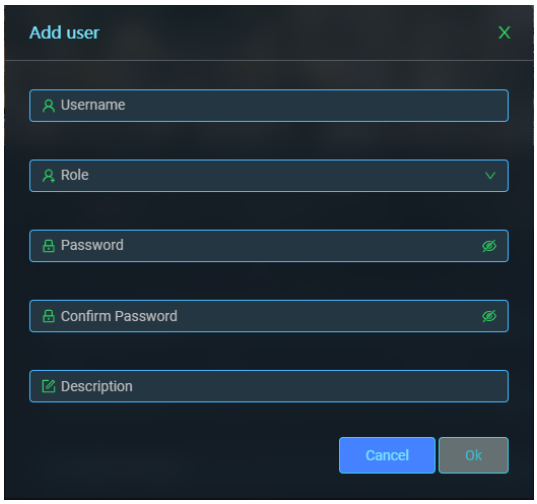
2. Enter the current password and the new password, then click **Save Password** button to set the new password.

4.10 Manage Users

This functionality is restricted to Admin accounts for user management. Normal accounts do not have these permissions.

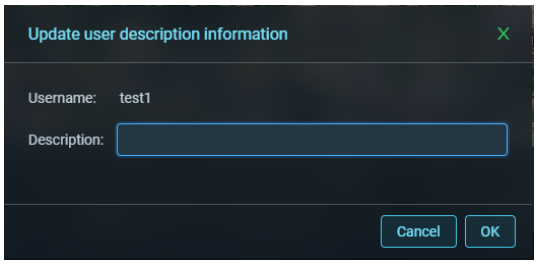
Add Users

1. In Function Display area, click **Settings**.
2. Click **Add** button, enter the new user's username, role, password, and description information, then click "OK" to add the new user.



Update User Description Information

1. In Function Display area, click **Settings**.
2. Select a user to be updated, click **Update** button, update the user's description information.



Delete User

1. In Function Display area, click **Settings**.

Select a user to be deleted, click **Delete** button, click **Confirm** to delete the user.

5 Equipment Maintenance

To ensure stable operation of the equipment, please comply with the following maintenance specifications.

5.1 Routine Maintenance

Maintenance Type	Maintenance Method
Interface protection	Seal unused interfaces with protective covers.
Cable maintenance	● Do not replace antennas without authorization after deployment. ● Ensure cables and interfaces are fully engaged and securely locked. ● Immediately replace any feeder/power/Ethernet cables with damaged jackets or exposed wires. ● Ensure plug pins are not bent or damaged.
Power inspection	Verify that the device is powered normally.

5.2 Basic Troubleshooting

Fault Type	Troubleshooting Method
Power-related fault	● Restart the power switch, boot the server, and launch the related services. ● Power off the device, wait for 30 seconds, and then restart it.
Network disconnection	● Use the *ping* command to test connectivity between the device and the server. ● Unplug and reconnect the network cable, then verify that the port indicator light is on and stable.
System Process	Log in to the "Device" interface to check the process status of the

Exception	controller, engine, and sensors.

If the issue persists, contact our technical support team.

Unauthorized personnel or non-designated maintenance personnel are prohibited from disassembling the chassis.

6 Packaging, Transportation and Storage

The equipment shall comply with the following requirements for packaging, transportation, and storage:

6.1 Packaging

The packing boxes shall be moisture-proof and shock-proof, and contain the following items:

- Delivery list
- Product Inspection Certificate
- User manual.

6.2 Transportation

In the process of transportation, avoid throwing, sun and rain, avoid mixing corrosive substances.

6.3 Storage

The storage shall meet the following requirements:

- Products should be stored in a cool, ventilated, dry warehouse.
- Do not put together with oil, away from heat sources.
- Stacking should be 20cm from the ground and 20cm from the wall.