# User Manual

## Applicable model: TCM4

## Version number: V1.0

# CONTENT

# 1. Product introduction

TM-CM4 integrates vehicle video monitoring, driving recorder, adas advanced driver assistance system and dsm driver status analysis system. Using h.265 video coding and decoding technology, the analog high-definition video recording, storage and playback are realized. Combined with 3g/4g wireless transmission technology and positioning technology, it can realize real-time uploading of video recording, automobile driving record information, driving behavior analysis and alarm evidence. Through the control center, the vehicle can be remotely monitored, analyzed and processed in real time.

This product has passed the relevant tests of automobile driving recorder and meets the following standards:
Jt/t 905.2-2014 Taxi Service Management Information System Part 2: Special Equipment for Operation
Jt/t 794-2019 "Technical Specification for Satellite Positioning System of Road Transport Vehicles and Compass Compatible Vehicle Terminal"
Jt/t 808-2019 Technical Specification for Communication Protocol of Satellite Positioning System for Road Transport Vehicles and Compass Compatible Vehicle Terminal.
Jt/t 1078-2016 Video Communication Protocol for Satellite Positioning System of Road Transport Vehicles
3c National Compulsory Product Certification Certificate of China

## 1.1. Product characteristics and specifications

- Built-in high-performance image processing chip
- H.264/h.265 coding, high compression ratio and clear image.
- 1-way built-in adas 1080p/720p camera
- Support 3 external 720p.
- Four video inputs: ahd/tvi/cvi/cvbs
- 1-channel video and audio synchronous output
- Unique gps drift suppression algorithm
- Built-in g-sensor monitors the running state of vehicles.

**Power supply:**

- Professional vehicle power supply design 9-36V DC wide voltage input design;
- Under-voltage, short circuit, reverse connection and other protection circuits, suitable for various models;
- Support intelligent power management identification, low power automatic shutdown, flameout and low power consumption;

**Data storage:**

- Adopt special file management mechanism to encrypt data and effectively protect data

security.

- Proprietary tf card bad track detection technology not only ensures the continuity of video recording, but also prolongs the life of tf card;
- Built-in super capacitor to avoid abnormal power-off data loss and tf card damage;
- Tf card supports 2 * 512g;

**Wireless module:**

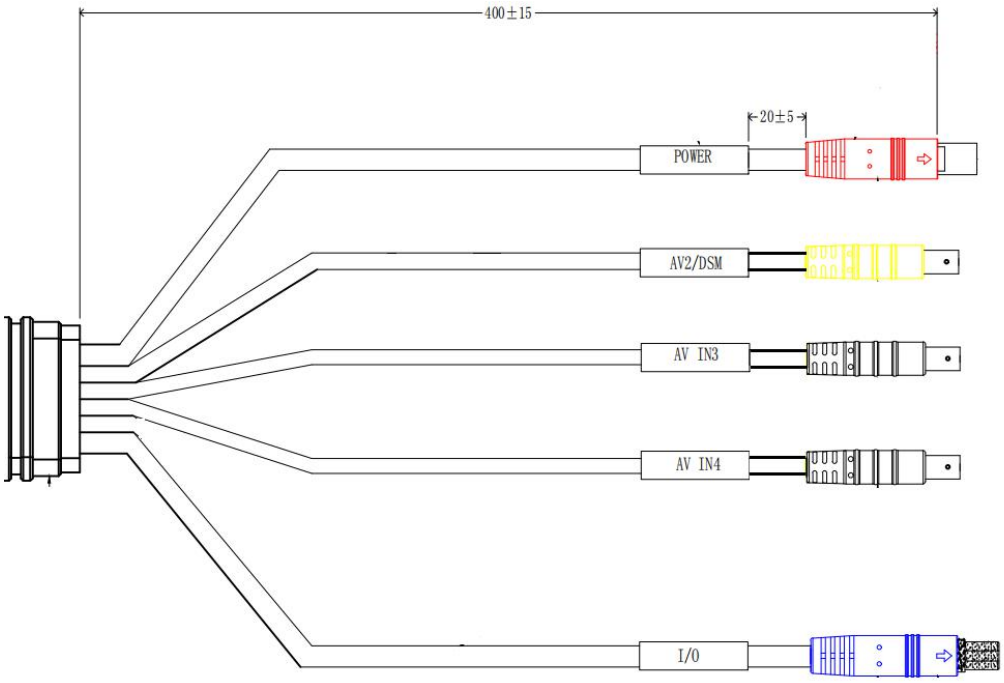
- Built-in gps/bd/glonass module, high sensitivity and fast positioning.
- Built-in 4g module, supporting 4g full netcom
- Wifi module, supporting frequency of 2.4ghz

| **Product technical parameters:** | | |
|---|---|---|
| project | Equipment parameters | Performance index |
| system | operating system | Embedded linux operating system |
| | operating language | Chinese/English |
| | Operating interface | Configuration through Simba Maintenance APP 3.0 |
| | Password security | User password management |
| audio and video | Video system | pal/ntsc |
| | Compression standard | h.265/h.264 |
| | image resolution ratio | 720p /960h/d1/cif（support 2ch 1080p） |
| | Playback quality | 720p /960h/d1/cif |
| | compound mode | 4-way flexible configuration |
| | Decoding ability | 4-way 720p real-time |
| | Video quality | Level 1 to 6 can be matched. |
| | Screen display | Support 1, 2, 3, 4 screen display. |
| | audio compression | g.711a、g.711u、g.726 |
| | Recording mode | Synchronous recording of sound and video |
| Video recording and playback | Video recording mode | Automatic, alarm |
| | Audio code rate | 8kb/s |
| | Video inquiry | It can be searched by channel and video type. |
| | Local playback | Multiplex playback |
| software upgrade | Upgrade mode | Manual upgrade, automatic upgrade, remote upgrade |
| | Upgrade method | U disk, tf card, wireless network |
| joggle/inter | Audio and video | 3-way 4pin BMW head interface; Built-in high sensitivity |

| | | |
|---|---|---|
| face | input | microphone |
| | audio output | Built-in 1.5w speaker |
| | Alarm input | 3 channels of input (positive/negative trigger can be matched, 1 and 2 channels support analog input) |
| | Alarm output | One output can directly drive the relay (<150ma). |
| | Tf card | 2 tf card interfaces |
| | Usb interface | 1 micro usb interface |
| | Ignition input | 1 acc signal |
| | light emitting diode | Pwr/run two-color lamp |
| | Sd card lock | one |
| | rs232 | 1 rs232 interface (debug function) |
| | rs485 | 1 rs485 interface |
| | Sim interface | 1 micro sim interface |
| extended function | gps | Internal ceramic antenna, gps+bd |
| | wireless | Support 4g full netcom |
| | wifi | Frequency 2.4ghz |
| other | Power input | dc：8v~36v |
| | Camera loading capacity | 1a/1v |
| | Typical power consumption | 10w (excluding peripherals) |
| | Working temperature | -20 --- 70℃ |
| | storage capacity | 720p 270mb/ hour/channel h.265<br>720p 510mb/ hour/channel h.264 |
| | measure | 111.38*87.3*27mm |

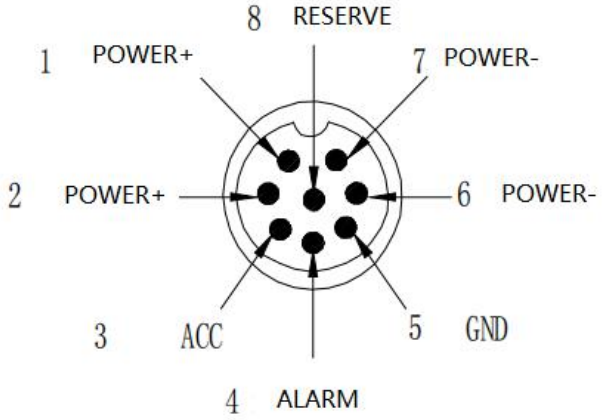
# 1.2. Interface definition

### 1.2.1. Definition of pull-off line



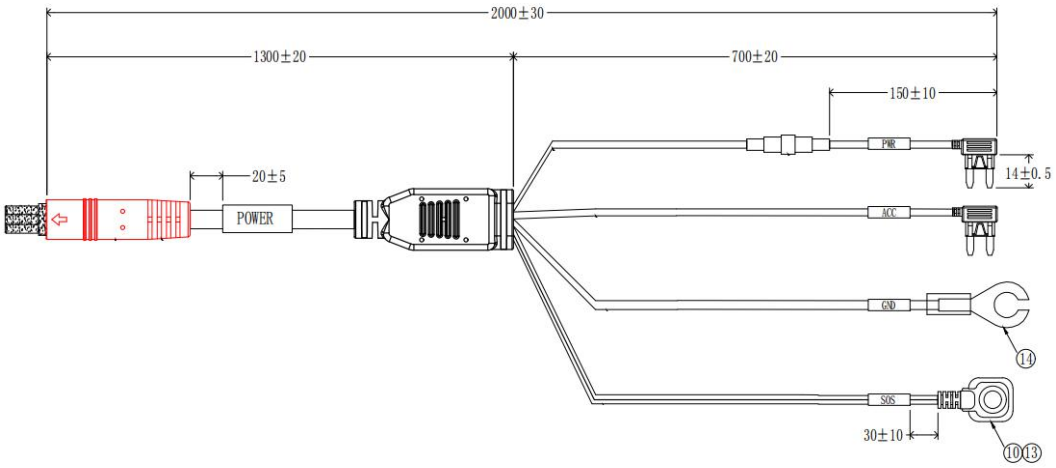

**Definition of pull-off line**

### 1.2.2. Power interface definition



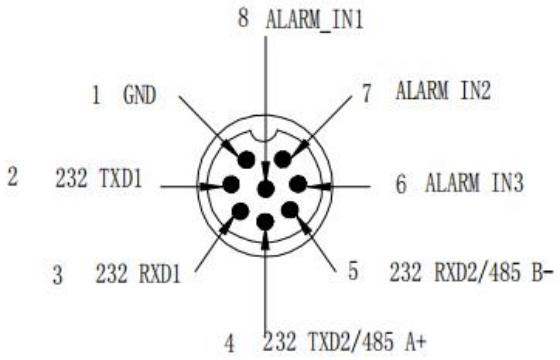

Power interface definition

### 1.2.3. Power extension cable interface




Power line definition

### 1.2.4. IO interface definition

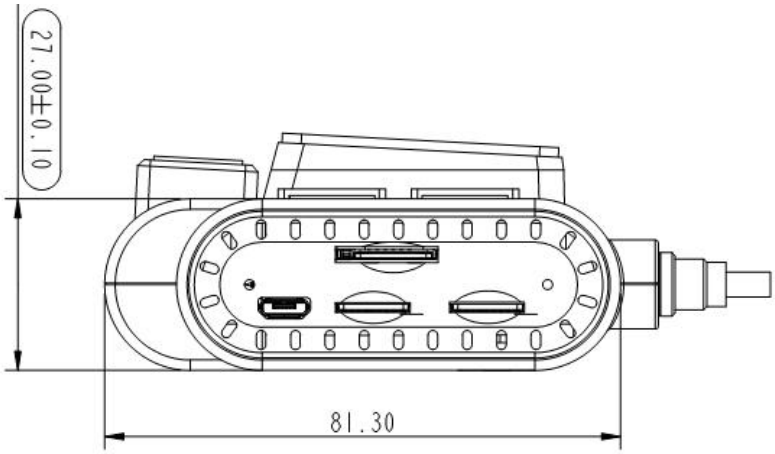


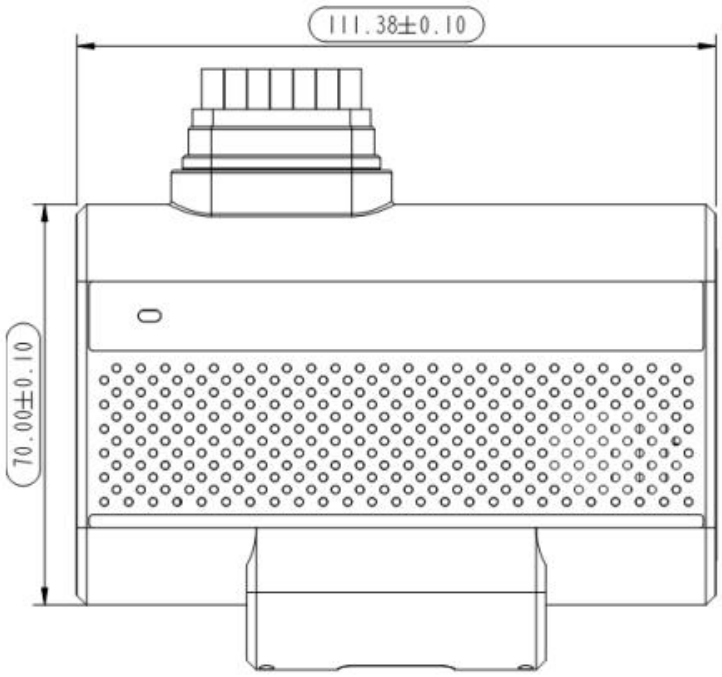

Front view of BMW head with i/o port

### 1.2.5. Audio and video interface definition


Av-in camera interface

### 1.2.6. Outline dimension drawing:






# 2. Preparation before product installation

## 2.1. Inspection of products and accessories

Before using this product, please check whether the product is damaged and whether the accessories are complete. If there is any missing, please contact your supplier.

The list of products and accessories as following:

| describe | picture | QTY | | describe | picture | QTY |
|---|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| host machine |  | 1 set | Accessories bag |  | 1 set |
| Power cord |  | 1 root | Mini DSM camera |  | 1 (optional) |
| I/o line |  | one | AHD camera in the car |  | 1 (optional) |

## 2.2. Preparation of tools required for installation

Please prepare auxiliary tools in advance before installation to facilitate site construction and installation. The details are as follows:

| NO. | Tool name | explaination |
|---|---|---|
| 1 | tape measure | Measuring body parameters during adas calibration |
| 2 | test pencil | Used to test whether there is electricity in the wire. |
| 3 | multimeter | Measure voltage value and whether it is short-circuited. |
| 4 | wire stripper | Stripping line for use after line search. |
| 5 | Electrical tape | After wiring, the thread ends are wrapped and used. |
| 6 | cable ties | Line arrangement and wiring use |
| 7 | Perforation | The wiring is used for opening, and the aperture is less than 15mm. |
| 8 | Screwdriver | Cross, word, central control and fixed equipment for use. |
| 9 | Rvv wire | When the standard line length of equipment is not enough, rvv conductor can be used to extend the connection, and the diameter of power extension line is not less than 1.0mm², and the signal extension line is not less than 0.5mm² |

# 3. Product installation and construction

## 3.1. Host installation location determination

The main engine should be installed at the top of the front windshield. In order to avoid affecting the driver's sight, it is better to install it above the right co-pilot seat and as close as possible to the center line of the vehicle, as shown in the following figure:

The device has a built-in gps positioning antenna. In order to avoid interference, the equipment should try to avoid the black shading area at the middle and upper part of the front windshield. The following figure shows the wrong installation method:

After the installation position is selected, paste the main engine on the selected position. Before fixing, please wipe the windshield clean, which can be wiped with adhesive. When pasting, ensure the horizontal angle of the main engine, and the left and right sides cannot be tilted. The main engine needs to be pressed for more than 1 minute to ensure the bonding strength, and the wiring harness of the main engine is hidden in the lining plate of the roof, as shown in the following figure:


## 3.2. Fitting installation

After opening the side cover of the device, insert the sim card and tf memory card in turn. Please pay attention to the chip direction.


**Note:**

1. Please use micro sim industrial ceramic integrated card for sim card.
2. Tf memory card: Please use SanDisk, Kingston or customized tf card (over 16g) purchased through regular channels.

After all accessories are installed, close the cover plate and fix it with screws (there are cover plates and fixing screws in the accessory bag). Please pay attention to the direction of the cover

plate (frosted surface facing outwards, smooth surface facing inwards).

## 3.3. Host power supply description

Connect according to the definition of power cord interface. Before connecting, please check the power supply voltage, which should be within the range of 8-36v. The recommended working voltage is 12v or 24v. When the length of the power cord is not enough, rvv wire can be used to extend the wiring, and the diameter of the power extension wire is not less than 1.0mm²


The red line (positive pole) of the power supply is connected to the positive pole of the main control power supply of the automobile.

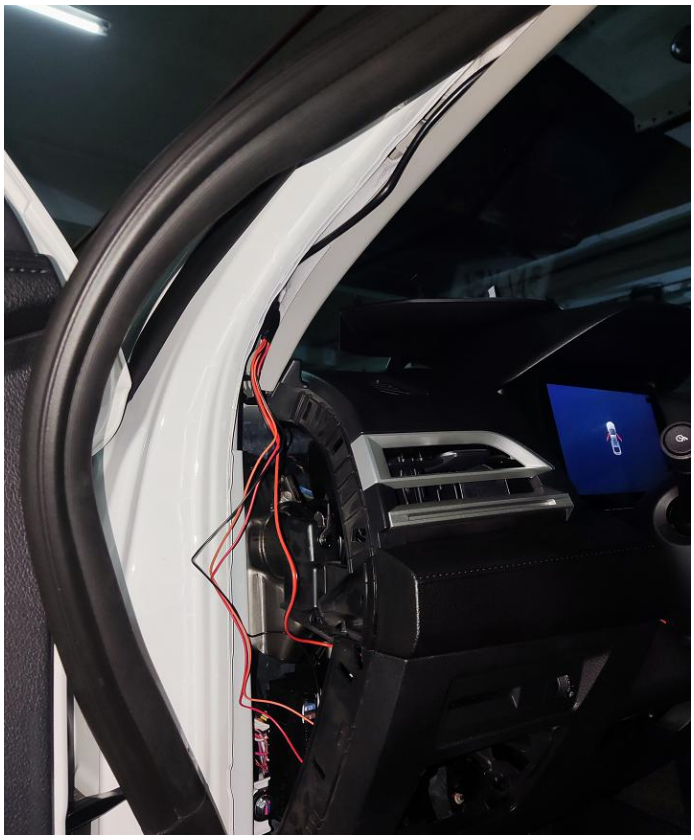
The black power supply (negative electrode) should be connected to the negative electrode or ground of the automobile power supply, and the ground should ensure good conductivity. The power supply orange (ignition) should be connected to the ignition control cable, which is the line that only has electricity when the vehicle is running.

When connecting the power adapter to debug the equipment, please connect the red line and the orange line together to the positive pole of the power supply.

When the equipment is normally powered on, the indicator light will turn red, which is always on. When the equipment is started normally, the green indicator light will flash and the red light will go out.

## 3.4. Wiring instructions

The extension wiring harness of the main engine should be concealed, which can be connected to the left A-pillar from the top inner liner, run down the inner liner of the left A-pillar or the rubber strip, and then connected to the vehicle fuse box, as shown in the following figure:



## 3.5. Constant current search

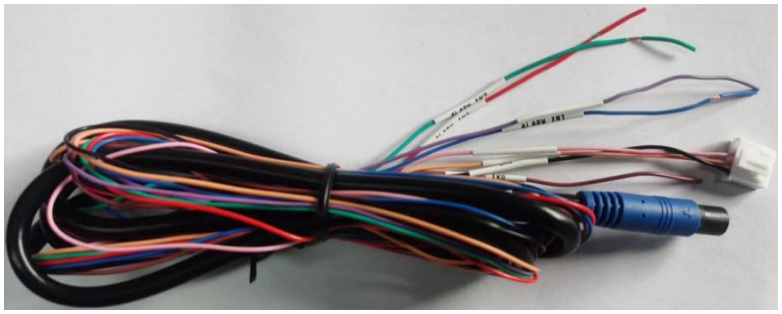
Turn off the vehicle key, open the vehicle fuse box, use electroprobe or multimeter to measure and find it, unplug it after finding the fuse with electricity, and insert the red plug of the power cord into the plug with electricity in the fuse slot (if the fuse plug models are different, it is necessary to use adapter or broken wire connection, please connect it according to the actual situation).

## 3.6. ACC lookup

Turn the vehicle key to the acc or on position, and use electroprobe or multimeter to measure and search. If the fuse is charged, it is proved that the fuse is basically controlled by the key acc. At this time, turn the vehicle key from the acc or on position to the off position, and measure whether the fuse is charged again. If it is not charged, it is proved that the fuse is an acc signal line, otherwise it needs to be searched again. After the search is completed, insert the orange acc line plug of the equipment into the live pin of the fuse slot (if the fuse plugs are not the same model and need to be connected by adapter or broken line, please connect them according to the actual situation).

# 3.7. Signal wire connection

The signal line of the host computer is connected according to the requirements of the driving recorder, and the i/o line is marked accordingly.
The definition table is as follows:



| Alarm definition | Function definition | colour | explain |
|---|---|---|---|
| Alarm input 1(alarm in1) | left-handed rotation | blue | Detection of 5~32v is effective. |
| Alarm input 2(alarm in2) | dextroversion | red | Detection of 5~32v is effective. |
| Alarm input 3(alarm in3) | Output and input multiplexing | green | Detection of 5~32v is effective. |

**Judgment method of left and right turn signal lines: Turn on the left and right turn signal lines and test them with electroprobe or multimeter. At this time, observe whether the voltage jumps (or the led lights in electroprobe flash), and** if so, prove that this wire harness is a left and right turn signal line.

If other signal wires are not used, the exposed wire ends must be cut off and wrapped with electrical tape to ensure that the exposed wire ends are not in contact with any part of the car body.

# 3.8. ADAS calibration

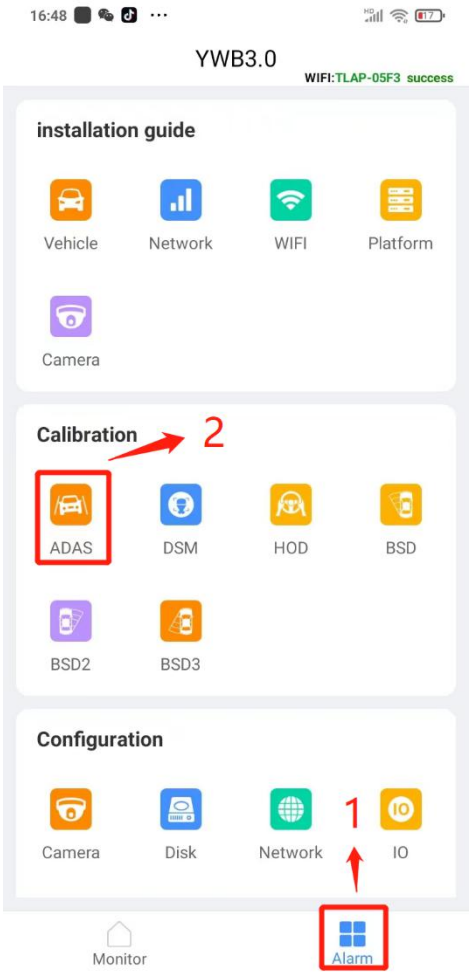
### 3.8.1. Body parameter measurement

Measure the required vehicle parameters: car body width, the distance from the center of adas camera to the left side of the vehicle, the installation height of the camera (the height of the center of adas camera perpendicular to the ground) and the distance from adas camera to the front bumper of the vehicle, and record the test results. Later, enter the corresponding body parameters in the calibration of the Simba Maintenance APP 3.0 app “adas ".

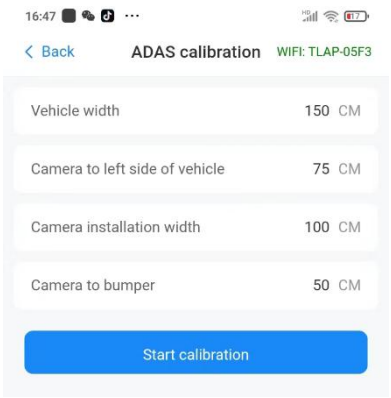
### 3.8.2. Parameter setting before calibration

After the mobile phone is connected to the Simba Maintenance hotspot, open the Simba Maintenance APP 3.0 app, log in and enter the interface, click Alarm buttons in the lower right corner 

, and select the adas button under "Calibration" in the menu bar to enter the adas calibration interface. 




Before calibration, you need to set the parameters of the vehicle, and the following parameters must be filled in correctly. Click "Start Calibration" after filling in. The specific instructions are as follows:




**Vehicle width: the actual width of the vehicle.**

**Camera to left side of vehicle: distance from center of adas camera to left side.**

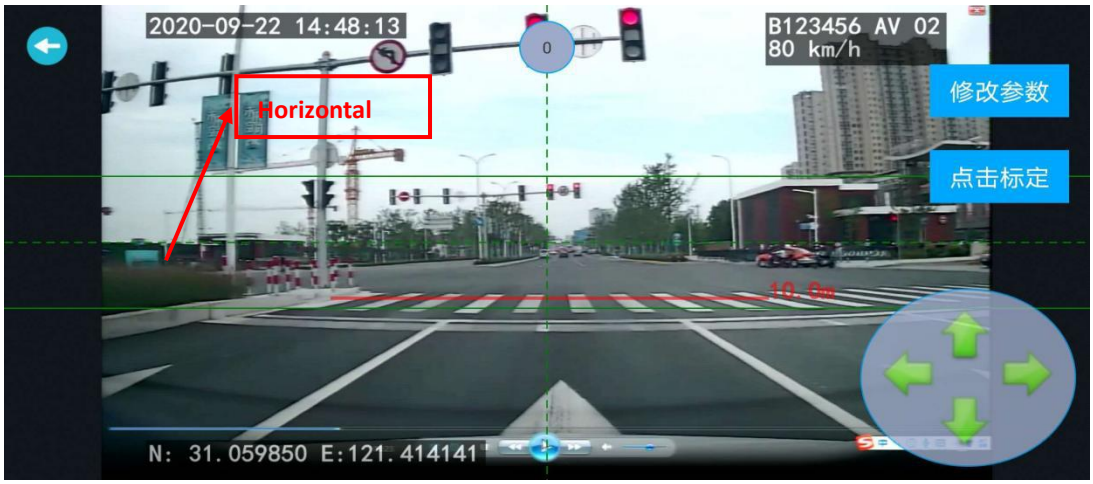
**Camera installation height: the vertical distance between the center of adas camera and the ground.**

**Camera to bumper: Measure the distance from the adas camera to the front of the car, which**

**is generally 0.**

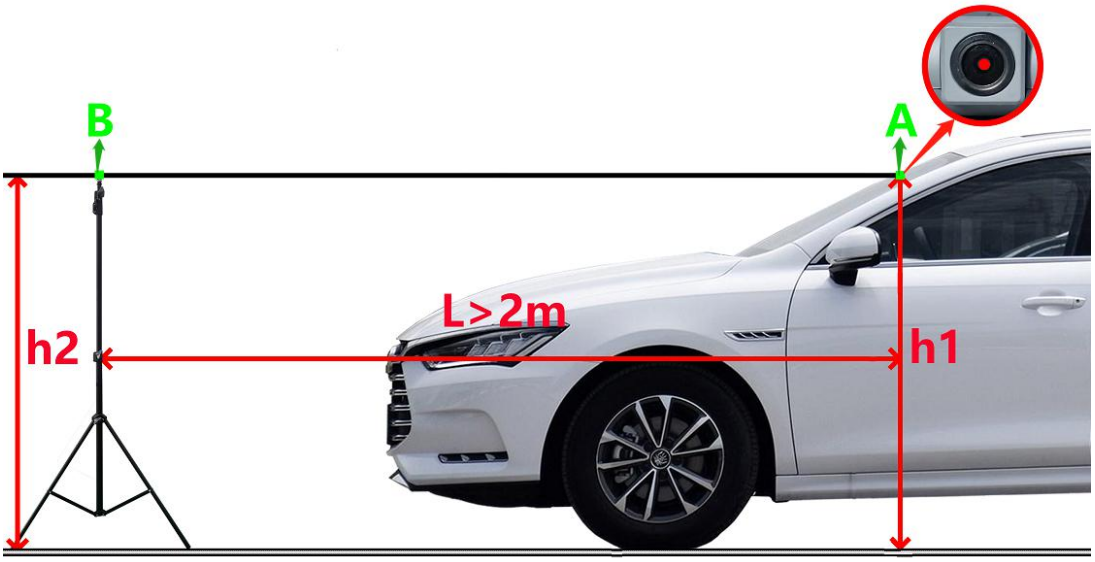
### 3.8.3. Horizon calibration

Park the vehicle on a flat road to ensure a wide field of vision in front of it, adjust the angle of the camera so that the distant skyline (the junction of heaven and earth) in the video coincides with the horizontal center line in the app (the horizontal green dotted line) (if it can't completely coincide, you can fine-tune it by using the up and down arrow keys), and then click to finish the calibration.

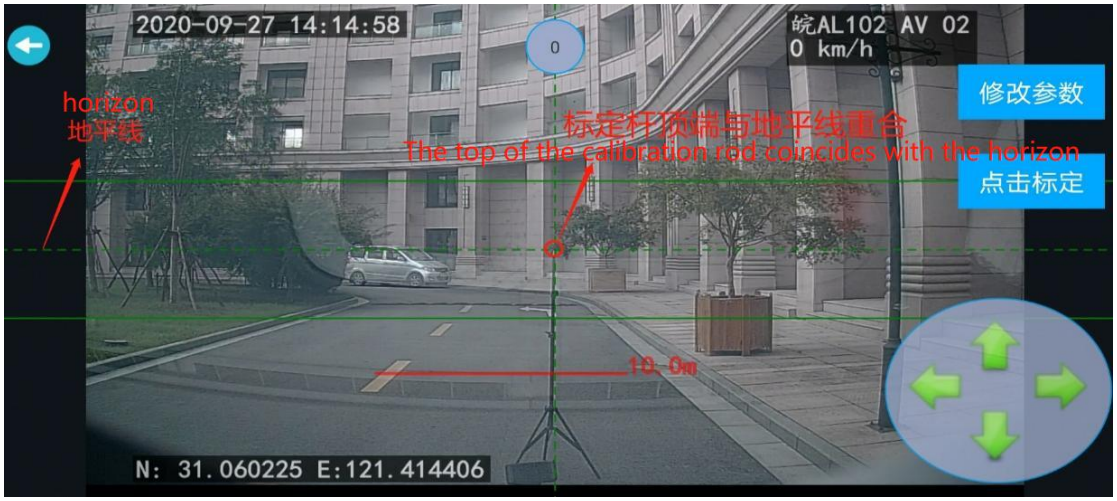



### 3.8.4. Calibration rod calibration

Place a calibration rod at the position in front of the car (in front of the camera) (the distance L between points A and B must be more than 2m), and the height h2 of the calibration rod must be the same as the height h1 of the center point of the adas lens from the ground, as shown in the following figure:




Adjust the angle of the adas camera so that the top of the calibration rod coincides with the horizon position in the app (if it can't completely coincide, you can fine-tune it by using the up and down arrow keys), and then click Calibration Complete.




Note: After the calibration of adas is completed, please lock the fixing screw of adas camera to avoid abnormal camera angle caused by vehicle vibration.

The fixing method as follows:

# 3.9. DSM installation calibration

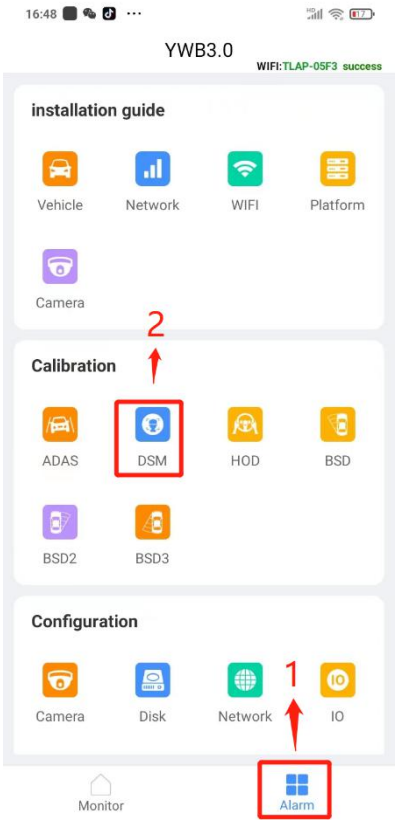
### 3.9.1. DSM installation

The dsm camera should be installed on the instrument panel at the left front of the steering wheel. Tear off the 3m film on the base of the dsm camera, stick the camera on the instrument panel, and then fix it with self-tapping screws for the second time to prevent the position deviation of the equipment after long-term operation.

Please connect the dsm camera (yellow plug) to the av2/dsm yellow interface of the host computer, and then wrap the interface with insulating tape. If the video screen is black, please confirm whether the resolution of the camera and the device is consistent.


### 3.9.2. Dsm calibration

After the mobile phone is connected to the Simba Maintenance hotspot, open the Simba Maintenance APP 3.0 app, log in and enter the interface, click all buttons in the lower right corner Alarm , and select dsm button under "Installation and Calibration" in the menu bar to enter the dsm calibration interface DSM1.




Adjust the angle of dsm camera so that the driver's face is in the center of the display interface. After clicking "Click Calibration", it will prompt "Success".


Lock the fixing screws on the bracket after calibration to avoid angle deviation caused by long-term vibration.

## 3.10. Precautions for installation

In order to ensure the safe use of the terminal equipment and prolong the service life of the equipment, please fully consider the following factors during installation:

a) After receiving the product, check the equipment and accessories. If you find that the items in the box are damaged or any accessories are in short supply, please contact the dealer in time.
b) When installing and operating equipment, comply with the specifications of relevant electronic products and the requirements of vehicles and other connected equipment.
c) Installation and construction shall conform to the specifications, and refer to relevant national or local standards.
d) Check the connected power supply voltage, and push the working voltage to 12v or 24v within the range of 8-36v to prevent equipment abnormality caused by voltage mismatch.
e) Vehicle-mounted video recorder should work in the temperature and humidity range allowed by technical indicators.
**f)** The external wires of the equipment shall be sufficiently spaced and protected by a flame retardant tube to ensure that the wires will not cause leakage due to wear or aging.

# 4. Product connection platform settings

The device can be connected to the platform through the Simba Maintenance app 3.0. Please download the latest Simba Maintenance app 3.0 first.

## 4.1. Download Simba Maintenance app 3.0

Please scan the QR code below to download the mobile app. (http://d.tl-tek.com/cn/Yunweibao/)

Please give priority to scanning and downloading with your mobile browser. After scanning WeChat, please click the option in the upper right corner, and then choose to open the link with your browser.
Note: Please download the version above 3.x.xx

# 4.2. Simba Maintenance APP 3.0 connection

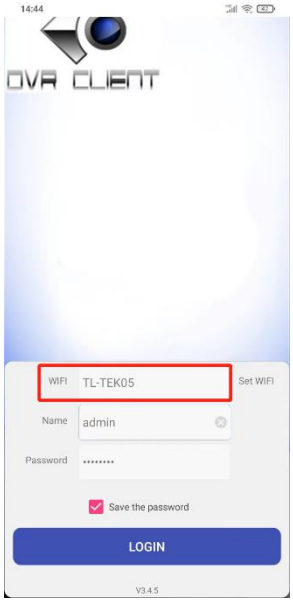
After the device is started, wait for about 1 minute, and use your mobile phone to search for WiFi hotspots. The hotspot name is TLAP-xxxx (the name of each Simba Maintenance tool is different), and the default password is 12345678. After the connection is successful, proceed to the next setting operation.

# 4.3. Simba Maintenance APP 3.0 settings

### 4.3.1. App login

Download and install the Simba Maintenance APP 3.0 app on your mobile phone. After opening the app, first confirm whether the name in the "wifi hotspot" is consistent with the name on the device label in the login interface. After the name is correct, click the "Login" button to enter the setup 

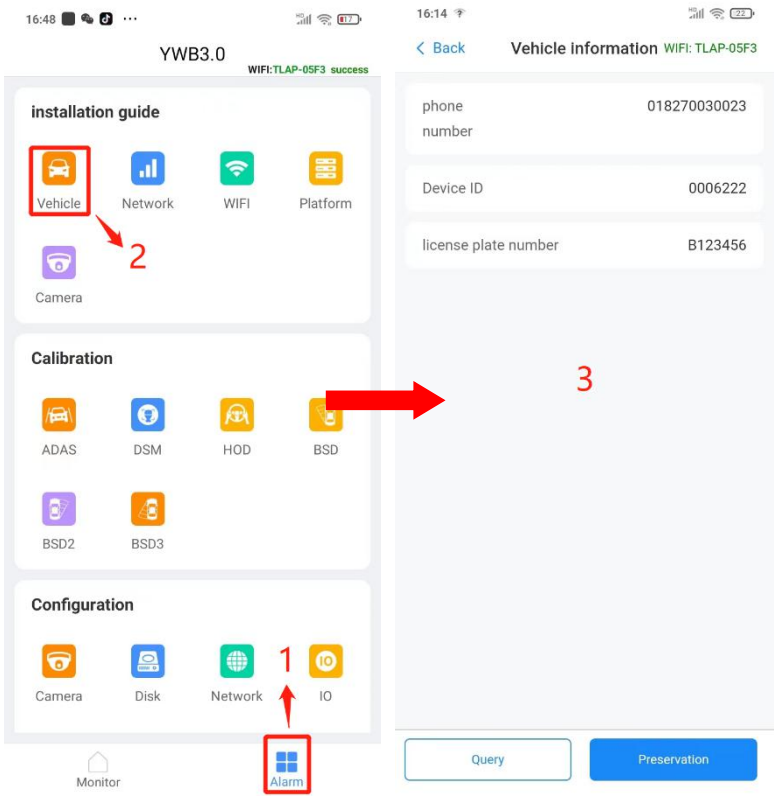
interface, as shown below:




If the name of wifi is inconsistent with the name on the device label, you need to click the "Set wifi" button on the right to reconnect.

### 4.3.2. Vehicle information setting

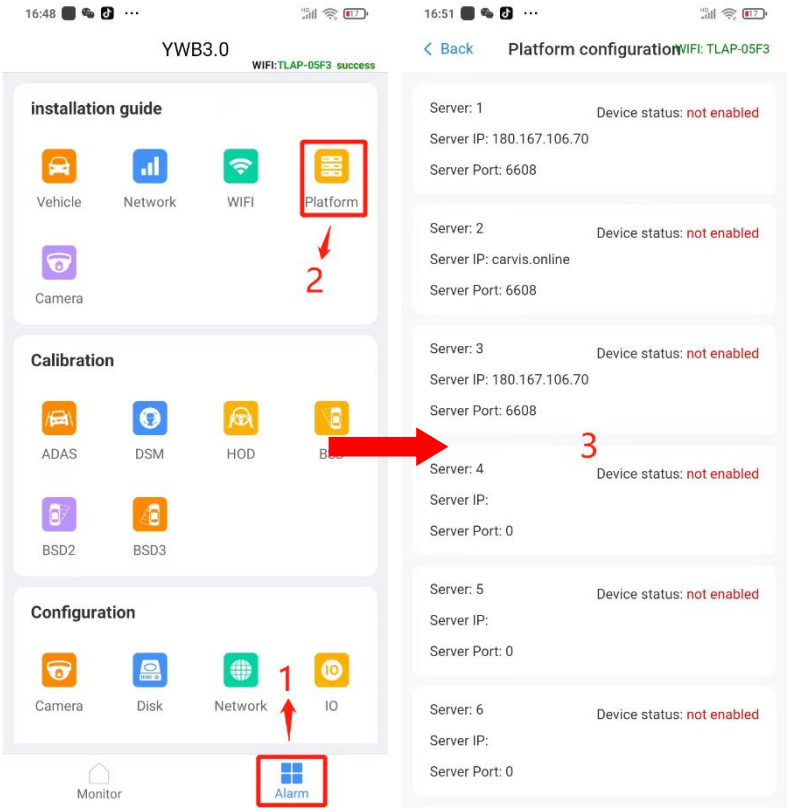
After the app logs in, select "Alarm"> "Vehicle" in the basic setting menu in the lower right corner to configure the parameters of "Vehicle" information, and then click "Preservation" to save the parameters. As shown below:



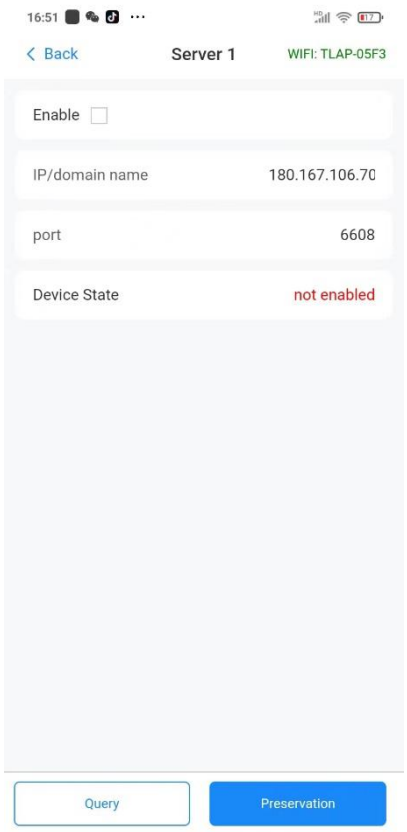

Set the parameters according to the platform check information, and the phone number, device id and license plate number should be consistent with the information added by the platform.

### 4.3.3. Platform setting

Select "Alarm" in the lower right corner> "Platform" in the basic settings menu to configure the parameters of "Platform" information. The device can support the connection of eight central servers at the same time. This interface can see the enabling status, online status, ip and port information of each server. Please set it as needed.



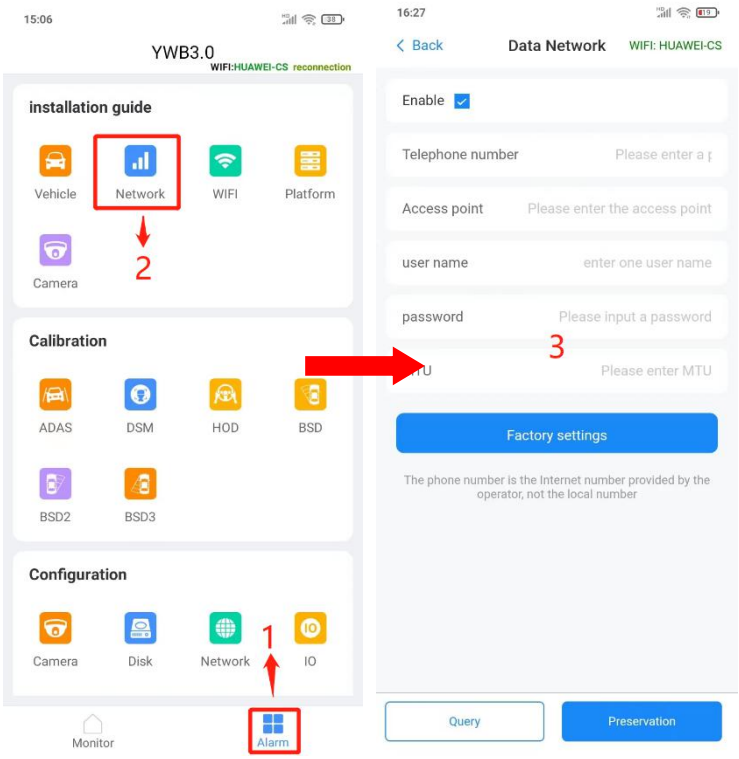

Click the corresponding server information to enter the detailed setting interface, which is shown below. Please fill in the server address and port correctly, and then click “Preservation” to save the parameters.




**Enable:** it can be used normally only after it is enabled, otherwise the interface information will be invalid.
**Ip/ Domain Name:** Please fill in the ip or domain name required to connect to the platform correctly.
**Port:** Please fill in the port required to connect to the platform correctly.
**Device state:** after setting, you can see the connection status of the platform (the accurate status can only be queried about 60 seconds after saving).

### 4.3.4. Apn/vpn settings

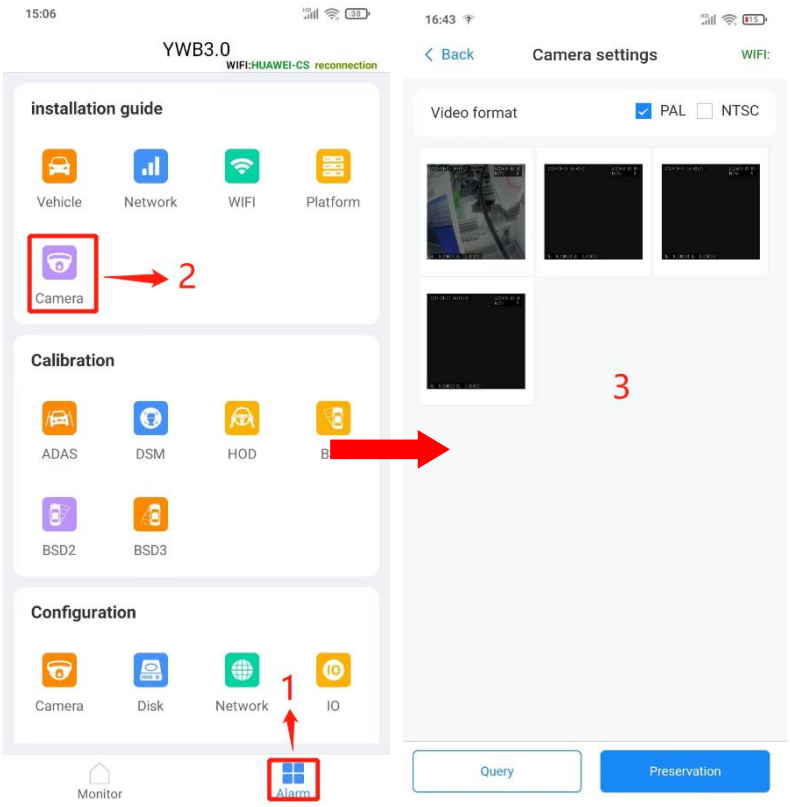
When using vpn private network, you need to set vpn dialing parameters, and then select "Alarm"> "Data Network" in the basic setting menu in the lower right corner to configure the "Data Network" parameters.



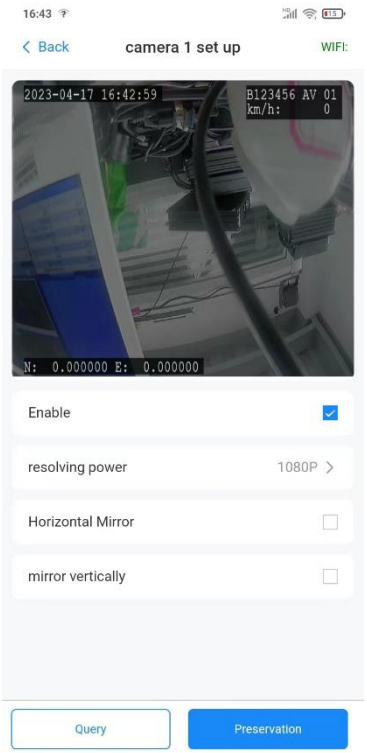

The specific parameters are subject to the parameters provided by the card vendor (no setting is required by default), and the corresponding apn or vpn values are filled in the "Access Point" setting item in the interface.

### 4.3.5. Camera mode setting

Select "all"> "camera settings" in the basic settings menu in the lower right corner to configure the parameters of "camera settings".




The camera setting interface can display the pictures of the current four channels. If the camera is not connected or the camera mode is wrong, the video loss picture will be displayed, and if it is not enabled, a black screen will be displayed. Click the picture display box to enter the parameter setting of this channel, and then click the "Preservation" button in the lower right corner to save the parameters.




**Enabled: all channels are enabled by default. If this** channel is not used, uncheck it, otherwise a video loss alarm will be reported to the platform.

**Resolution: Please set it according to the camera mode.** If it is not set correctly, the image will not be displayed normally. Four resolutions are supported: 720p(ahd), tvi720p, cvi720p and 960h. The default is 720p.

**Horizontal Mirror: When checked, the device image will be horizontally inverted.**

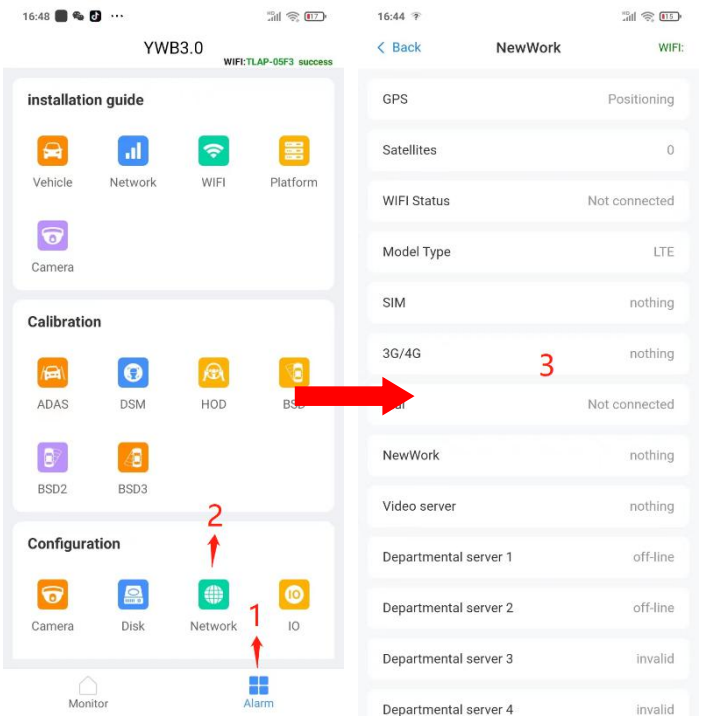
**Vertical Mirror: When checked, the device image will be vertically inverted.**

### 4.3.6. Product status view

In the "Configuration" column, you can view the status information of camera, disk, network, platform and equipment.

#### 4.3.6.1. Network state

Select "All" in the lower right corner> "Network" in configuration status in turn to view the "Network" status, as shown below.




**Gps: "Locked" is normal, and there are several** other states-

1. Unauthorized means that the gps function is not supported.
2. During positioning, the device is searching for gps.

**Satellite number: displays the number of satellites searched by the equipment and the satellite** signal strength. When the number of satellites reaches more than 7 and the signal value reaches more than weak (strong, medium, weak and poor), the gps data will be stable. If it cannot be reached, the installation location needs to be changed.

**Wifi module: in the following states respectively.**

1. Without authorization, the device does not support wifi.
2. Yes, the device can search for available wifi.
3. None, the device can't search for available wifi.

**Wifi status: check the networking status of wifi.**

1. Not connected, not connected to wifi.
2. Connected, connected to wifi.

**Module type: 3/4g module information, which uses lte by default.**

1. When no module is displayed, the device does not support the communication function or the module fails.

**Sim card: the insertion detection status of sim card.**

1. Yes, the device has detected the sim card.
2. No, the device has not detected the sim card.
3. Abnormal. The device detects the sim card, but it cannot read the sim card correctly.

**3g/4g signal: It indicates that it is not necessary to check whether the antenna is plugged in**

**or whether the apn is set correctly at all times. Generally, it indicates** that the signal strength is weak-strong, which means normal.

**Dialing: Dialing networking status of sim card.**

1. Connection. The sim card of the device is connected normally.
2. No connection. The device is not connected to the sim card network.
3. During dialing, the sim card of the device is dialing the Internet.
4. If the registration fails, check whether the sim card is open or in arrears, and whether the apn is set correctly.

**Network type: generally divided into wifi(wifi connected to the Internet) and** 2/3/4g(sim card connected to the Internet). When both networks can access the Internet, the priority is WiFi> 2/3/4G.

**Video server: cmsv6 private protocol platform connection status (this status is not displayed when the device does not support** private protocol).

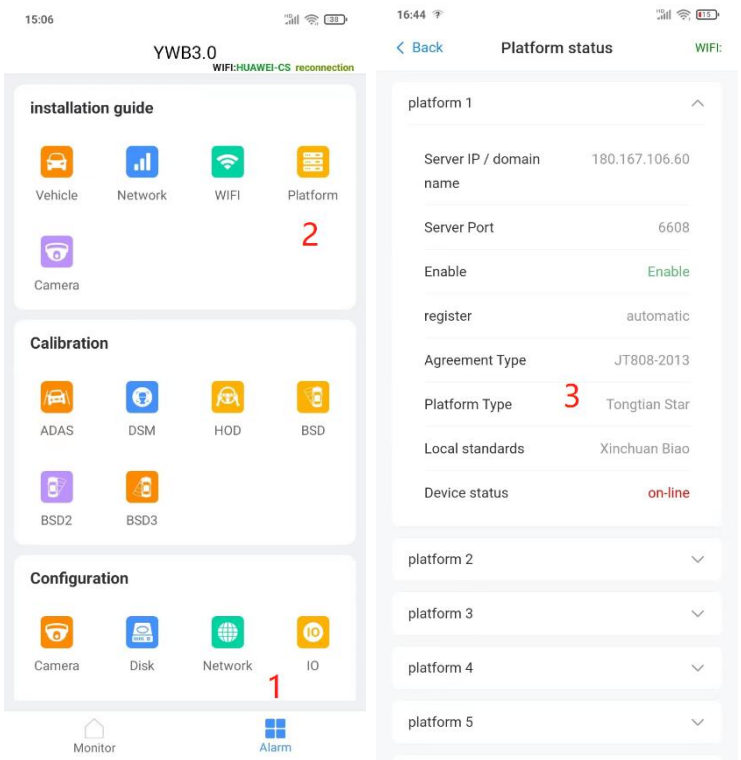
When offline is displayed, the device is not connected to the server connected by private protocol, and when online is displayed, it is connected to the server normally.

**1-8: 808 protocol platform connection status of the server (this status is not displayed if the device does not support 808 protocol).**

1. Online is connected to the platform normally, while offline is not connected to the platform.
2. If it is not enabled, the ip enabled status of this road is not checked. The authorization expires, please contact the relevant business.
3. Conflict, which is the same as the ip set by other routes, and there is conflict.
4. Online/locked, the device is normally connected to the platform, and the ip of this road is locked and cannot be modified.
5. Offline/locked, the device cannot connect to the platform, and the ip of this road is locked and cannot be modified.

#### 4.3.6.2. Platform connection state

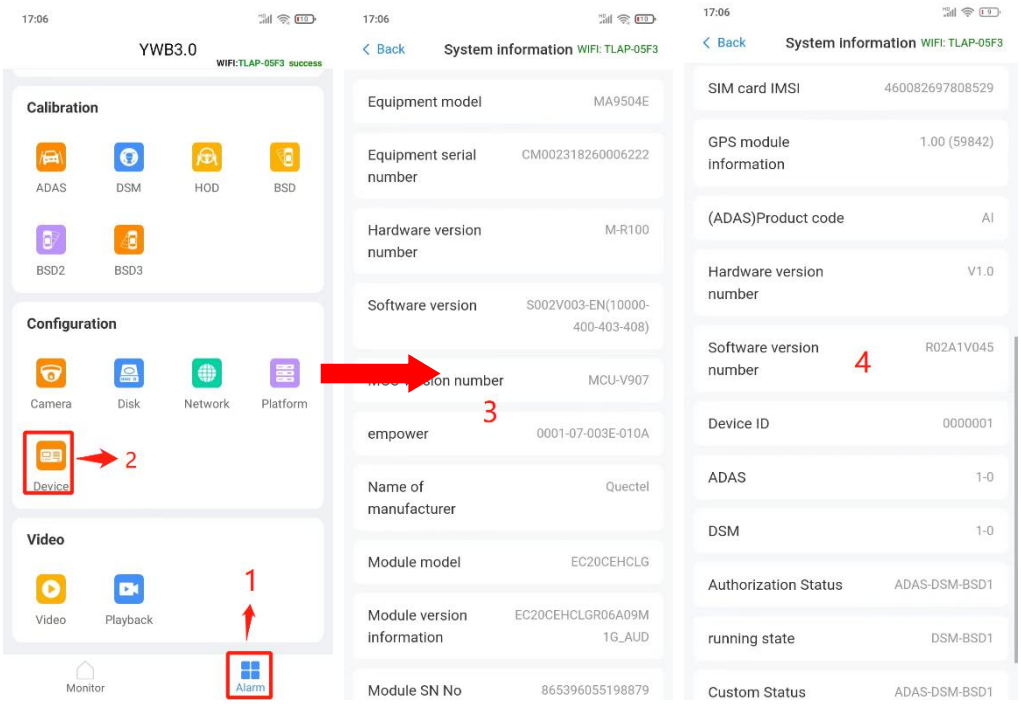
Select "all" in the lower right corner> "platform" in configuration status in turn to view the connection status of "platform", as shown in the following figure.




In the "Platform" information, you can view the setting information and connection status of eight platforms. When "Online" is displayed in the "Equipment Status", it means that the equipment is connected to the modified platform normally.

#### 4.3.6.3. Device status

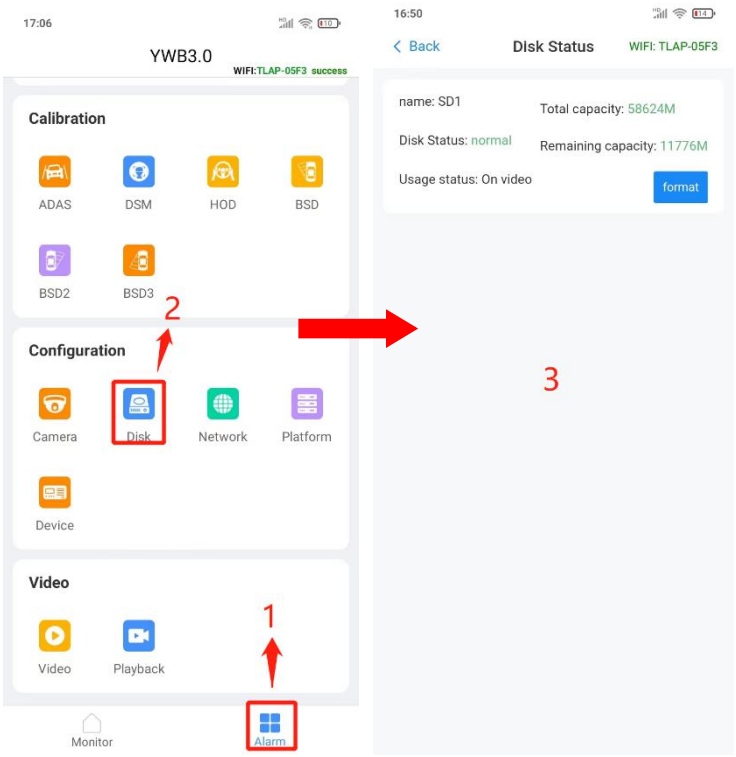
Select "all" in the lower right corner> "equipment" in configuration status, and you can view the information of "equipment", as shown in the following figure.




In the "Device" state, you can view the software and hardware version of the device, the version of 4g\gps module, ai status information (authorization, customization, operation), etc. You can look at the basic information first when troubleshooting the problem.

#### 4.3.6.4. Disk state

Select "all" in the lower right corner> "Disks" in the configuration status to view the information of "Disk", as shown in the following figure.




You can see the status of sd1 and sd2 in the "Disk" information.

**Name: sd1 corresponds to device tf1. If only** one disk information is displayed, the device only supports a single card.

**Total capacity: the total capacity of the current tf card**

**Remaining capacity: the remaining capacity of the current tf card, which is 0 when the video is overwritten.**

**Disk status: Displaying "Recording" means that this tf card is recording video, "Normal"** means waiting for recording, and "None" means that the tf card is not inserted or damaged.

**Usage status: Displaying "On video" means that this tf card is recording video,** and "None" means that the tf card is not inserted or damaged.

When two tf cards are inserted at the same time, one of the disk states must be displayed as "Recording or Overwriting", otherwise the device will not be able to query the recording.

## 4.4. Frequently asked questions

| pheno menon | Phenomenon analysis | processing method |
|---|---|---|
| Unable to boot | The power supply is not connected correctly. | Connect the wiring as required and ensure that the input voltage is within 8-36v. |
| | Power cord fuse | Eliminate the cause of burning and replace the fuse. |
| Can't | Parameter setting error (server not | Reset according to the instructions |

| | | |
|---|---|---|
| connect to the center | connected) | |
| | Sim card arrears (dialing or registration failure) | Recharge after inquiry |
| | Apn parameter error (dialing or registration failure) | Check the parameters with the operator and reset them. |
| | Is the sim contact good (without sim card) | Reinsert and install sim card. |
| | Disk lock unlocked (power off) | Lock the disk lock, and there is a prompt on the disk status in the upper right corner. |
| No video recording | Unformatted disk | Format disk locally or remotely. |
| | Disk damage | Replace disk |
| | The disk lock is unlocked. | Lock the disk lock, and there is a prompt on the disk status in the upper right corner. |
| Unable to locate | Vehicles are in underground parking lots and tunnels. | Leave the area |
| | Always showing positioning | Tighten the positioning antenna and place the antenna as required. |
| | Antenna short circuit | Replace the positioning antenna |
| No image display | Incorrect interface definition | Check whether the interface definitions are consistent. |
| | Mode setting error | Follow the camera mode for setting. |
| | Camera damage | Replace the camera with a new one |

After the installation is completed, you need to check the following:

| | | |
|---|---|---|
| **Check item** | Is the universal joint secure? | |
| | Is the camera locked? | |
| | Is the face in the middle of the picture? | |
| | Has the camera protective film been torn off? | |
| | Can the alarm be generated normally? | |
| | Is the adas screen normal? | |
| | Did adas complete the calibration? | |
| | Is 4g dialing successful? | |
| | Did the device successfully connect to the server? | |
| | Does the platform check whether the equipment is positioned? | |
| | Is the platform alarm data normal? | |
| | Is there any training for customers?<br>1、equipment installation<br>2、Equipment debugging<br>3、Equipment alarm test<br>4、Platform use method<br>5、Frequently asked questions and answers | |