Streamax

M1N-TKH0401

Installation Guide



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Foreword

This *M1N-TKH0401 Installation Guide* is hereby prepared to better guide engineering personnel to install M1N-TKH0401 and its accessories properly and quickly, and to improve installation efficiency.

This document mainly includes the following parts: foreword, system overview, preparation for installation, introduction to installation, calibration, and acceptance and cleaning.

This document is applicable to installation engineering personnel.

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Important Instructions

1. Before installation, please park the vehicle on the horizontal ground and shut down the engine (do not park the vehicle on a ramp or an inclined road).
2. Please read the section of packing list carefully and check carefully at the time of unpacking.
3. Please read the section of tool list carefully and provide installation tools before product installation.
4. Before installation, please observe the vehicle environment and follow the principles below:
   a. The installation position and wiring of the product shall neither affect the driver's view nor affect the adjustment of the rearview mirror and sun visor;
   b. The camera lens for monitoring the road condition ahead of the vehicle must be within the working range of the windshield wiper;
   c. The installation position of the camera for monitoring the driver in the vehicle shall comply with local regulations;
   d. The installation position shall be convenient for the replacement and maintenance of TF card and SIM card.
5. The appropriate installation position shall be selected according to the vehicle environment, and this document is for reference only.
6. The appropriate power supply connection method shall be selected according to the vehicle environment. **The connection to the power supply and all signal cables of vehicle shall be carried out by specialized personnel, as it may be dangerous for non-specialized personnel to operate the power system of the vehicle without authorization.** This document is for reference only.

7. In case of any problem in the installation for special vehicles, please contact the product supplier in time for support.
8. Veyes App is required to debug and configure M1N-TKH0401 during installation.
9. Please scan the QR code below, or search and download the Veyes APP in the App Store. After the download is completed, connect the APP to the equipment for related operations according to the prompt on the interface of the APP.



IOS (Apple Store) (to be replaced)



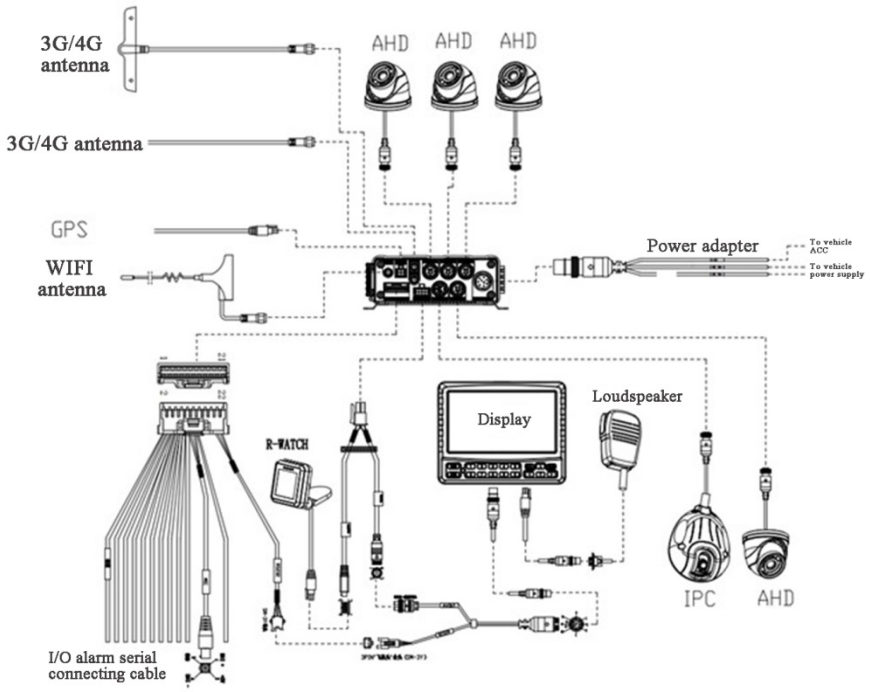
Foreign Android (Google Store) (to be replaced)

1. System Overview

1.1 Product Overview

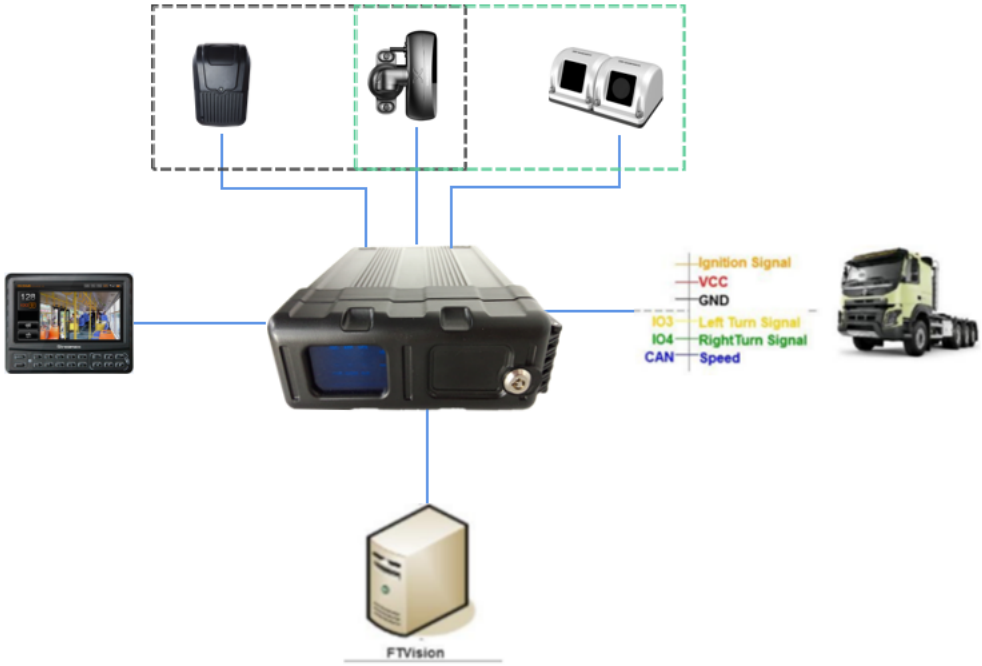
M1N-TKH0401 is a cost-effective and functionally scalable device specially designed for vehicle video surveillance and remote video surveillance. It has high-speed processor and embedded operating system, combining the most advanced H.265 video compression/decompression technology and GPS/BD positioning technology in the IT field. It supports video recording in 1080P, 720P, WD1, WHD1, WCIF, D1, HD1 and CIF formats. The product supports the extension of AI intelligent algorithm, to realize advanced driver assistance system (ADAS) alarm, blind spot detection (BSD) and driver status monitoring (DSM), and thus effectively improve drivers' safe driving and reduce traffic accidents.

1.2 Schematic Diagram of System Connection

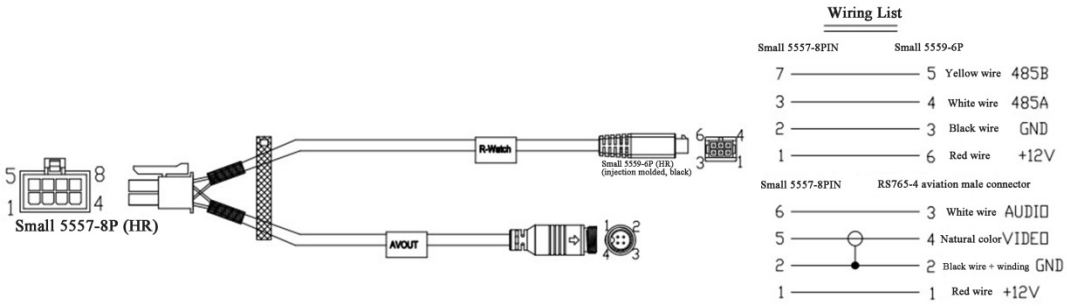


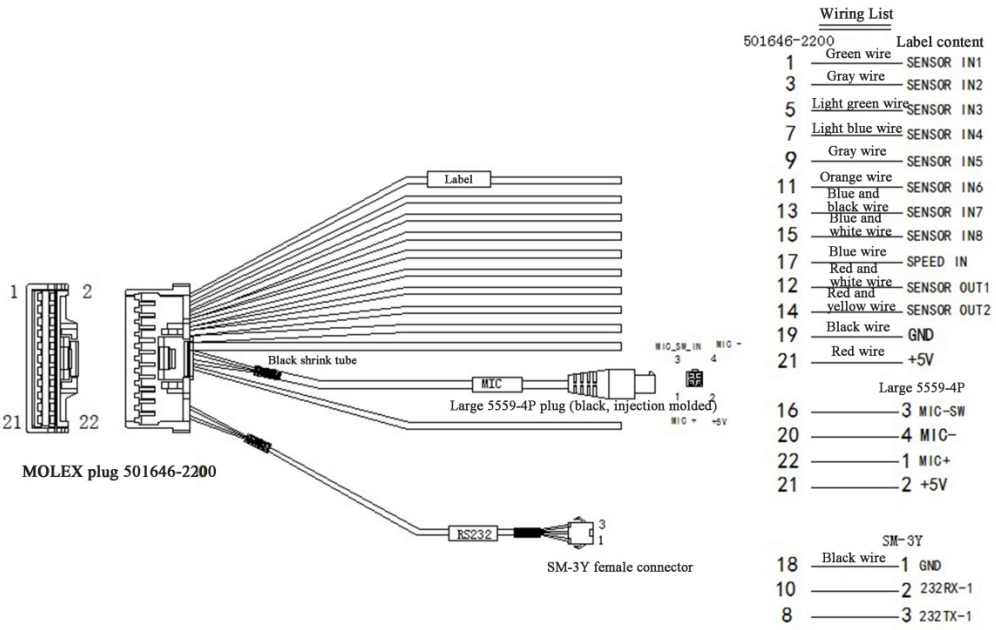
1.3 Schematic Diagram of Equipment Connection

Optional ADAS + DMS or DMS + BSD



1.4 Definition of External Cable Interface





2. Preparation for Installation

2.1 Technical Requirements for Installation

Relevant personnel shall be familiar with the functions, applications and the overall composition principle of the product.

Relevant personnel shall understand the electrical circuits and structure of motor vehicles, and common installation methods of in-vehicle equipment.

2.2 Understanding of Installation Environment

Before equipment installation, relevant personnel shall have a clear understanding of the vehicle model concerned, the installation positions of the main unit and auxiliary cameras of the EDR, the type and length of cables required for each vehicle model, and the list of common auxiliary materials, so as to ensure successful completion of equipment installation and commissioning.

2.3 Confirmation of Vehicle Conditions and Vehicle-related Electrical Information

Confirmation of vehicle information is the basic precondition of successful installation and also the guarantee of division of responsibilities to avoid any damage to the vehicle. For each component, proceeding to next step is only allowed after clear confirmation, and each

operation shall be confirmed by the person in charge of the vehicle and the installation personnel.

(1) Check the appearance and interior trims of the vehicle for any damage.

(2) Check whether the vehicle can ignite normally.

(3) Check whether the vehicle power supply system is in good condition.

*Note: Confirmation of the above information is crucial. Installation can only be carried out after the above information is considered normal through confirmation.

2.4 Power Supply Connection of Vehicle

The main unit is connected to the vehicle power supply. For specific power supply connection method, refer to 4.3 for details.

(1) Required tool: multimeter.

(2) Selection of power supply connection position

When the vehicle is shut down, use a test pencil to detect whether the circuit is live. If it is live, it is judged as a constant power supply, and then measure the voltage.

When the vehicle is shut down and is in ACC position or ignition state, use a test pencil to detect whether the circuit is live. If it is electrically neutral in shutdown state, and is live in ACC position or ignition state, it is judged as an ACC power cable, and then measure the voltage.

(3) Voltage measurement of power supply connection

Constant power supply: When the vehicle is shut down, use a multimeter to measure whether the voltage of the constant power supply cable is about 24V. If the voltage of multiple cables is about 24V in shutdown state, select the cable with higher current as the constant power supply connection cable.

ACC: When the vehicle is in ACC position or ignition state, use a multimeter to measure whether the voltage is about 24V. If the voltage is 0 in shutdown state and about 24V in ACC position or ignition state, select the cable as the ACC power supply connection cable.

*Note: During power supply connection, first conduct measurement at the positive and negative terminals of the power supply with a multimeter, to avoid wrong connection.

2.5 Connection of Necessary Signal Cables

Where required, the following signal cables must also be connected to enable the intelligent assisted driving functions of M1N-TKH0401:

(1) Vehicle speed pulse cable or CAN data cable - to obtain accurate vehicle speed data;

(2) Left and right steering signal cables - to obtain left and right steering information of vehicle;

(3) Brake signal cable - to obtain vehicle braking information.

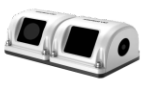
Please consult the maintenance engineer of the vehicle discipline for specific position of vehicle speed pulse cable/CAN data cable. Generally, the left and right steering signal cables and the brake signal cable are arranged on the fuse board below the steering wheel or below the front passenger dashboard, and measurement for these cables can be conducted using a multimeter.

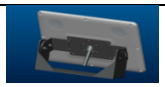
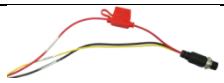
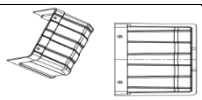
*Note: If the measured signal is a pulse signal, the source of left steering/right steering/brake signal shall be set as pulse on the setting interface of the main unit; if the measured signal is a continuous high or low level signal, the source of left steering/right steering/brake signal shall be set as level on the setting interface of the main unit.

3. Preparation of List of Installation Materials and Tools

3.1 Inspection as per Packing List

After unpacking the product, please confirm whether the EDR is intact and whether the accessories are complete.

List of Product Materials				
S/N	**Picture**	**Product Name**	**Purpose**	**Qty.**
1		M1N-TKH0401	On-board main unit with hard disk	1 pcs
2		ADAS camera	Road condition detection	1 pcs
3		DMS camera	Driver behavior detection	1 pcs
4		BSD camera	Blind spot detection	1 pcs
5		R-WATCH	Intelligent display screen	1 pcs
6		CP4	Video display screen, optional	1 pcs

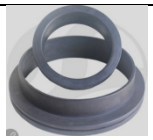
7		CP4 bracket	Support the display screen on a slant	1 pcs
8		CP4 patch cord	Display screen patch cord	1 pcs
9		CP4 extension cable	Display screen extension cable	1 pcs
10		4G antenna	4G communication antenna	1 pcs
11		Alarm serial connecting cable	RS232 serial port with IO alarm input	1 pcs
12		9PIN power cable	Power input cable	1 pcs
13		Rear shield assembly	Protect the interface connection	1 pcs
14		MINI key	Unlock	1 pcs
15		WIFI antenna	Enhance the WIFI signal	1 pcs
16		7.5A fuse	Socket-mounted fuse, plug-in, ordinary type 32V, 7.5A	1 pcs
17		15A fuse	Socket-mounted fuse, plug-in, ordinary type blue case, 32V, 15A	1 pcs
18		Wet and dry paper	Clean the camera lens or the windshield	2 pcs
19		Standard SIM card	Dial-up, self-purchased	1 pcs
20		6PIN audio and video extension cable (optional length)	IPC camera audio and video extension cable, optional	1 pcs
21		4PIN audio extension cable	AHD camera audio and video	1 pcs

		(optional length)	extension cable, optional	
22		External GPS module	High-precision positioning, required	1 pcs

3.2 Preparation of Installation Tools

Before installation, the following installation accessories and tools shall be made available.

List of Installation Tools and Accessories				
S/N	**Picture**	**Name of Tool**	**Purpose**	**Qty.**
1		Torsion drill	Tighten screws	1 pcs
2		Common screwdriver socket	Tighten screws; optional	1 pcs
3		Crow plate	Pry up the vehicle panel	1 pcs
4		Ties	Bundle cables	Several
5		Dry cleaning cloth	Clean the countertop	1 pcs
6		Smartphone/pad	Install the EasyCheck App for video preview and parameter configuration	1 pcs
7		Steel tape	Measure the installation height of the forward-facing ADAS camera lens and assist the installation in other scenarios	1 pcs
8		Mark pen	Mark lines for main unit installation	1 pcs
9		Cutting nippers	Cut and strip wires	1 pcs
10		Insulated rubber tape	Wrap wire ends	1 pcs

11		Scissors	Cut insulated rubber tape or wire clip	1 pcs
12		USB flash disk	Standby	1 pcs
13		Multimeter	Locate vehicle power supply	1 pcs
			Measure the conduction of harness	
			Measure pulse signal	
14		3M adhesive tape	Fix DMS camera	1 pcs
15		Rubber sleeve	Rubber sleeve at the opening for cable protection	Several
16		Corrugated conduit	Aesthetic wiring and cable protection	

The following installation tools are also required for the installation of DMS camera if required:

DMS Camera Installation Tools				
S/N	**Picture**	**Name of Tool**	**Purpose**	**Qty.**
1		Cross screwdriver	Adjust and fix the DMS camera lens at certain angle (generally included in the DMS camera packaging)	1 pcs
2		3.5mm*25mm self-tapping screw	Fix camera; standard (generally included in the DMS camera packaging)	4 pcs
3		PH2 cross screwdriver	Tighten the lens screws; for ADAS calibration	1 pcs

The following installation tools are also required for the installation of BSD camera if required:

BSD Camera Installation Tools				
S/N	**Picture**	**Name of Tool**	**Purpose**	**Qty.**
1		Wire stripper	Strip and cut wires, and cut ties	1 pcs
2		Multimeter	Locate vehicle power supply Measure the voltage of vehicle	1 pcs
3		Common screwdriver Socket	Fix bracket and camera	1 set
4		20m tape measure	Ranging and calibration	1 pcs
5		Electric hand drill	Drill holes on the carbody	1 pcs
6		High-speed steel drill bits	Drill holes on the carbody 3.4mm and 3.8mm drill bits	Several
7		Tapper	Drill holes on the carbody for the concealed installation of tail harness 18mm and 20mm drill bits	Several
8		A piece of steel wire	Lead wires to pass through holes	1 pcs
9		EasyCheck App	Calibrate camera	1 pcs
10		Ties	Put harness in order	1 bag

11		3M insulated rubber tape	Connection insulation	1 pcs
12		Mini type level	Ensure that the camera is installed vertically	1 pcs
13		SUPER 918A Glass sealant	Seal holes on carbody for waterproofing	1 pcs

3.3 Preparation of SIM Card and TF Memory Card

To ensure normal online communication and data storage of the equipment, please prepare a supporting Micro SIM card and a TF memory card that meets the quality requirements before installation.

4. Installation of M1N Main Unit

4.1 Installation of SIM Card and TF Memory Card

Take out the main unit (without powering on), unlock the front panel of the main unit with the key in the package, and then insert SIM card and SD card.

Install SIM card and SD card as shown in the figure below (pay attention to the insertion direction of the cards).

① Unlock with the key; ② Open the front panel; ③ Open the card slot baffle; ④ Insert SIM card and SD card according to the direction of the silk-screen printing mark; ⑤ Restore: Cover the baffle, fasten the panel and put the hard disk lock in the lock position.

If you feel smooth and flexible during installation of SIM card and SD card, and hear a clear sound of "Da" when pushing in the cards completely, it indicates that the cards are installed in the correct direction; if there is obvious friction resistance during installation, it indicates that the installation direction is wrong. Take out the cards in time to avoid any damage to the cards and the card holder.

*Note:

(1) Do not touch the surface of the metal contact of the SIM card with hands when taking and installing the card, for fear of contaminating the SIM card by dust and sweat stain.

(2) Before installing SIM card, please check the surface of the metal contact of the SIM card for any dirt (such as dust, fingerprints and water stains). If any, clean the surface with a piece of non-woven fabric or rubber.

Close the front panel and lock it with the key after the SIM card and SD card are installed.

4.2 Installation of M1N Main Unit

Installation requirements of M1N main unit:

① The installation position of the main unit shall be flat. Keeping the main unit sidelong and on a slant shall be avoided as far as possible.

② There shall be enough space to open and close the front panel (without affecting the removal and replacement of SIM card and SD card).

③ There shall enough distance at the tail of the main unit to plug and unplug the aviation connector (without affecting the connection), and the tail harness must be wrapped firmly and neatly.

④ Install the rear shield assembly to protect the interface connection.

⑤ Make sure the main unit is of good heat dissipation.

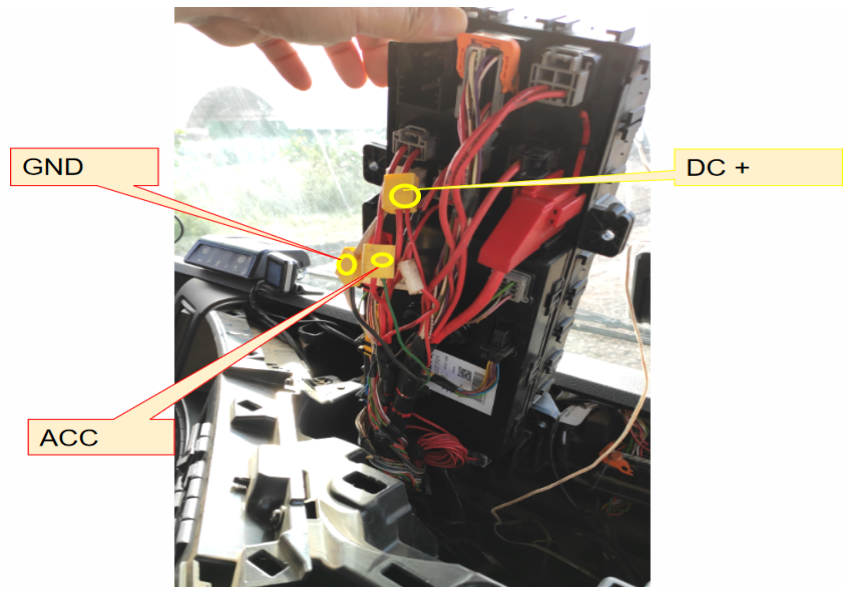
If the above conditions are met, tighten the screws to fix the main unit, as shown in the figure below.

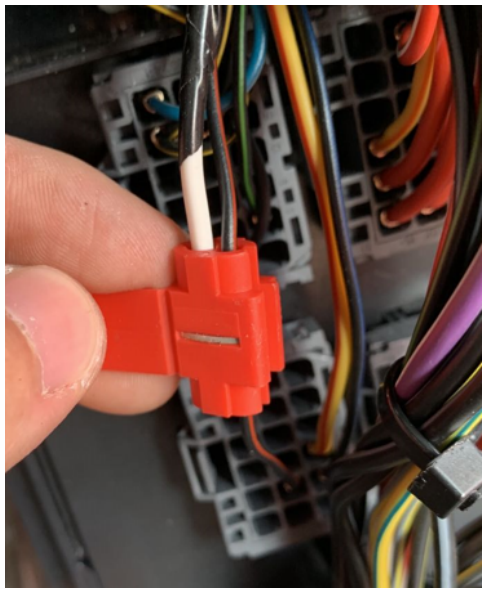


4.3 Power Supply Connection and Connection of Signal Cables

4.3.1 Power Supply Connection

Power cable: Connect DC+ to the vehicle constant power supply, ACC to the vehicle power cable, and GND to the vehicle ground wire.





*Note:

The power line shall be connected using "special stripping-free connection terminal" where possible (no stripping is required, so as to avoid the risk of electric leakage), and the connection shall be wrapped with insulated rubber tape to avoid electric leakage/short circuit.

If there is no special stripping-free connection terminal, stripped wires can also be used for connection. In this case, the connection process must conform to the standard specifications. After the connection is completed, the connection shall be wrapped with insulated rubber tape to avoid electric leakage/short circuit.

4.3.2 Connection of Signal Cables (Pulse or CAN/Left/Right Steering Signal/Reversing)

1. Vehicle speed pulse or CAN (one out of two)

   (1) Consult the maintenance engineer of the vehicle discipline to locate the vehicle speed pulse cable. In the discrete-wire alarm serial connecting cable:

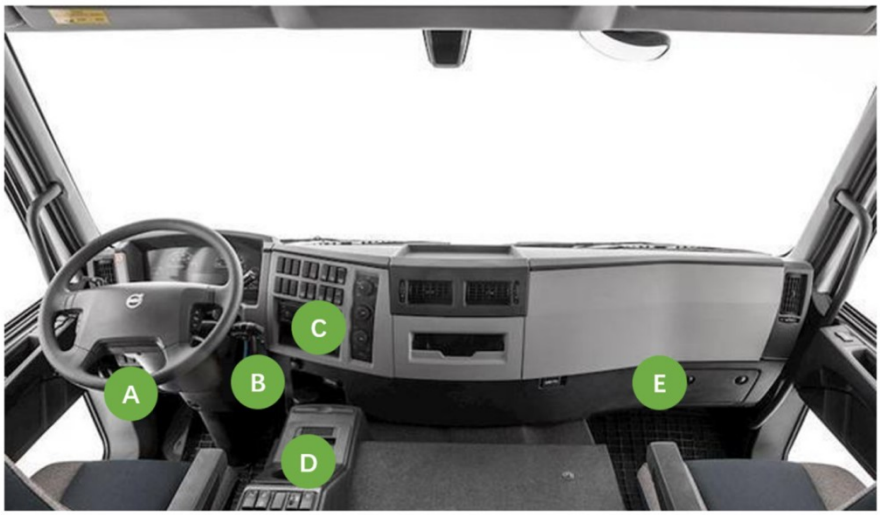
   Connect "SPEED IN" to the vehicle speed pulse cable;

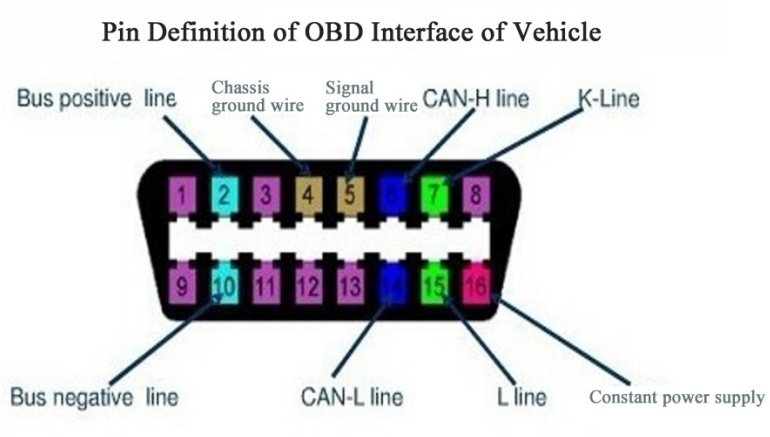
   After the connection is completed, log in to the EasyCheck App to connect the M1N main unit. Enter the configuration interface, and set the speed source of the equipment as "Pulse". At the same time, drive the vehicle for a short distance at the installation site to test the accuracy of vehicle speed pulse data.

   (2) Consult the maintenance engineer of the vehicle discipline to locate the OBD interface of the vehicle. Generally, the position of the OBD interface of the vehicle is as shown in the figure below. Locate CAN-H and CAN-L cables of the vehicle behind the OBD interface. Take the standard 16PIN inverted trapezoidal OBD interface as an example, CAN-H and CAN-L cables generally correspond to pins 6 and 14, respectively. (The cable sequence varies with the shape of OBD interface. The example here is only for illustration.)

After the connection is completed, log in to the EasyCheck App to connect the M1N main unit. Enter the configuration interface, set the CAN model and baud rate of the equipment, and set the speed source as "OBD". At the same time, drive the vehicle for a short distance at the installation site to test the accuracy of vehicle speed pulse data.

General Position of OBD Interface of Each Vehicle Model





2. Left steering/right steering/reversing signal

After locating the fuse board below the steering wheel or the front passenger dashboard, measure the cable corresponding to left steering/right steering/reversing signal according to the tips on the cover back of the fuse board or using a multimeter.

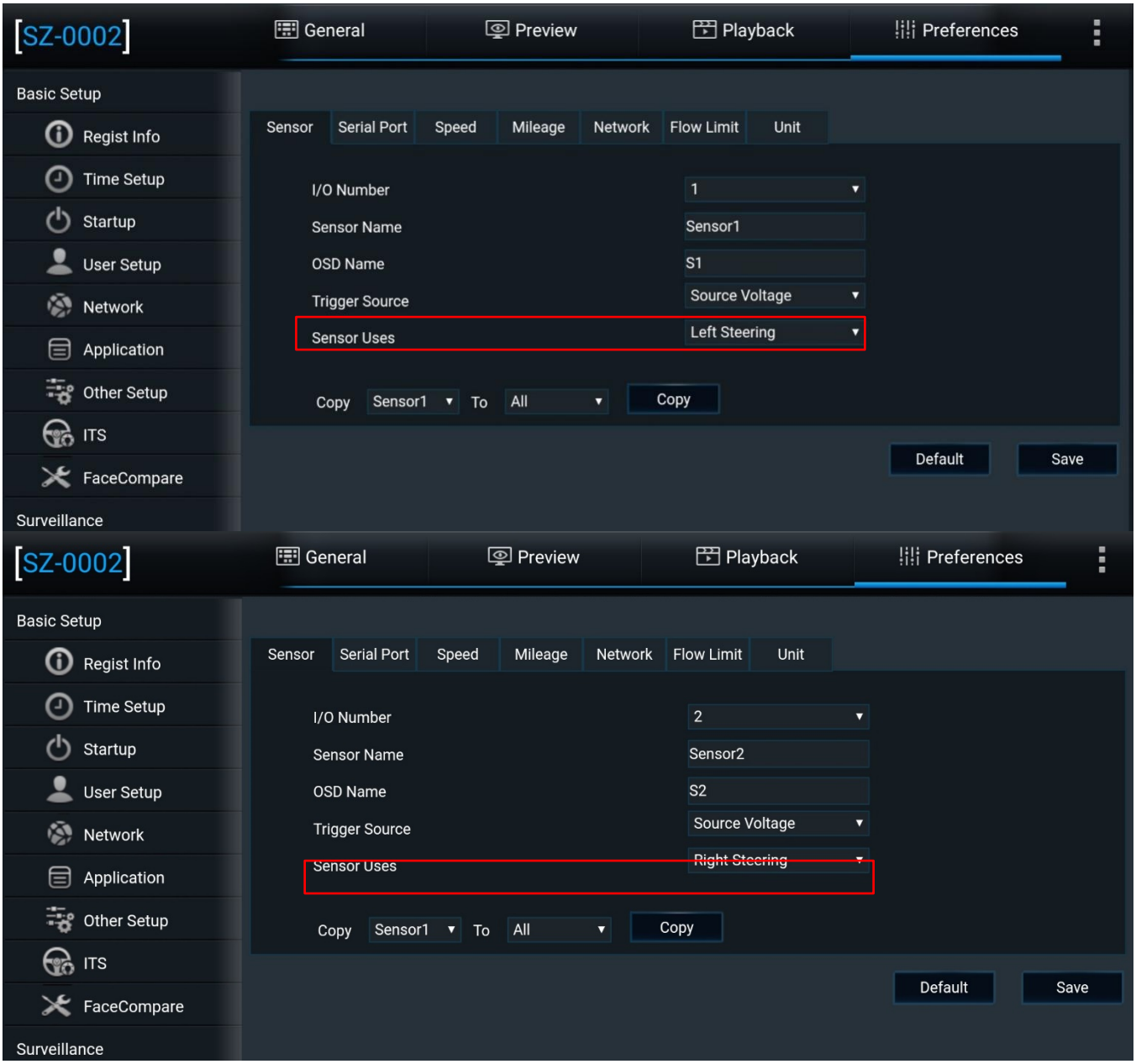
There are eight IO signal cables in the discrete wire, and the signal cables such as left steering, right steering and reversing all need to be connected. Moreover, it is necessary to connect the M1N main unit through the EasyCheck App, so as to enter the configuration interface and set the use of corresponding signal cable.

Example:

① Connect SENSOR IN1 to the left steering signal cable of the vehicle. In this case, click [Preferences] > [Collection] > [General] > [Sensor] in sequence to set the "**Sensor Uses**" as "**Left Steering**", and then click "**Save**".

② Connect SENSOR IN2 to the right steering signal cable of the vehicle. In this case, click [Preferences] > [Collection] > [General] > [Sensor] in sequence to set the "**Sensor Uses**" as "**Right Steering**", and then click "**Save**".

③ Connect SENSOR IN3 to the reversing signal cable of the vehicle. In this case, click [Preferences] > [Collection] > [General] > [Sensor] in sequence to set the "**Sensor Uses**" as "**Reversing**", and then click "**Save**".



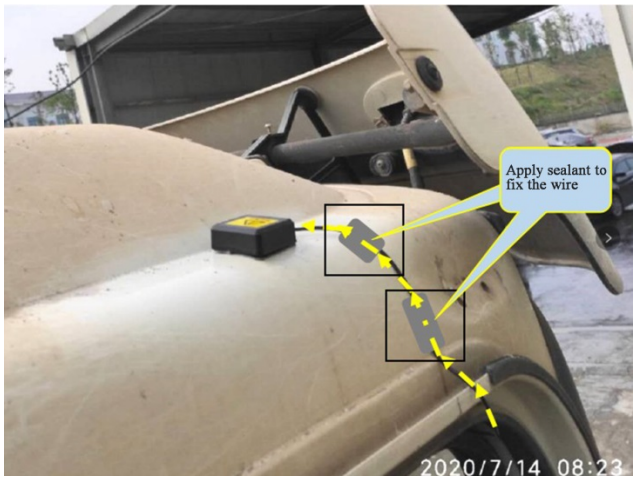
*Note:

If the measured signal is a pulse signal, the source of left steering/right steering/brake signal shall be set as pulse on the setting interface of the main unit; if the measured signal is a continuous high or low level signal, the source of left steering/right steering/brake signal shall be set as level on the setting interface of the main unit.

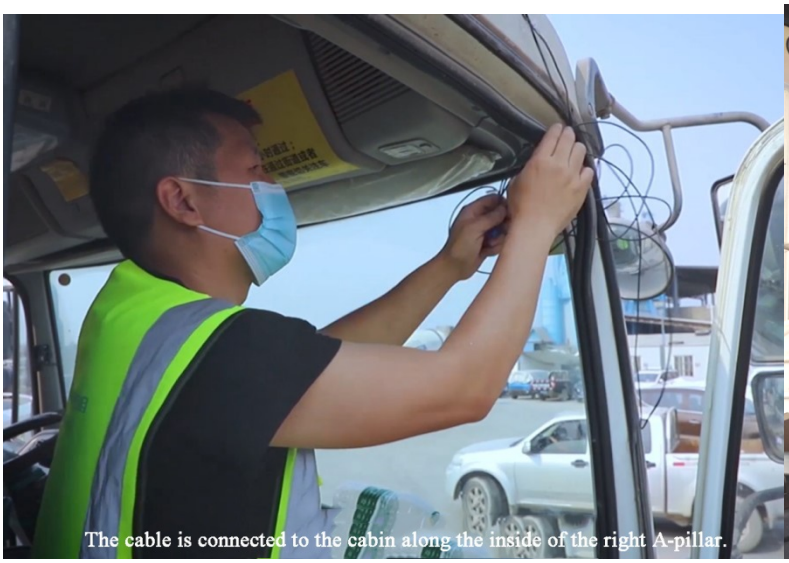
4.4 Installation of GPS, 3G/4G and WiFi Antennas

4.4.1 Installation of GPS Antenna

The GPS antenna is fixed to the exterior of the vehicle.









The operating steps are as shown above:

1. Arrange the GPS antenna under the A-pillar door rubber strip on the right side of the cabin.
2. Lead the GPS antenna to the exterior of the vehicle along the route under the door rubber strip. Note: The notched position by the door shall be selected where possible.
3. Fix the GPS antenna on the exterior of the vehicle with sealant.

4. Attach GPS to the roof with the labeling side up. Clean the area of the roof where GPS is to be attached, and then stick the 3M adhesive tape firmly. Finally, apply sealant to the area around the tape for secure fixation.

4.4.2 Installation of 3G/4G Antenna





Tear off the 3M adhesive film on the 3G/4G antenna and stick the antenna under the A-pillar at the front passenger side.

Installation requirements:

① The equipment that may interfere with 3G/4G signals, such as original on-board GPS positioning module, shall be kept more than 15 cm away from the antenna.

② Excess tail harness of the 3G/4G antenna shall be concealed in the A-pillar or the center console.

4.4.3 Installation of WiFi Antenna

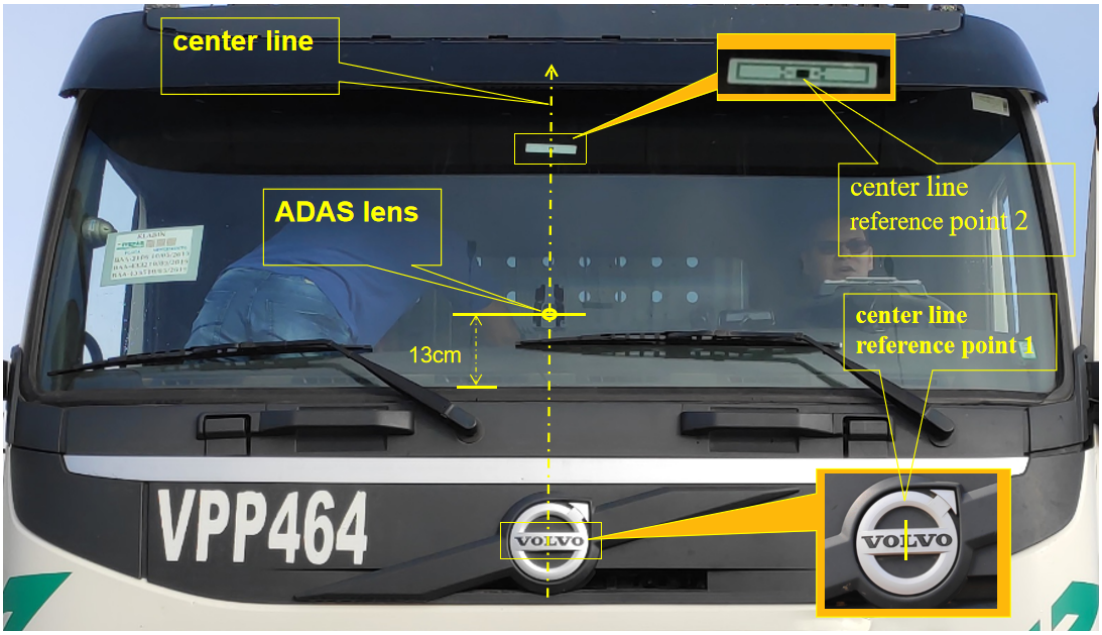
Tear off the 3M adhesive film on the bottom of the WiFi antenna to stick the antenna to one side of the vehicle center console (**a picture is required here**).

The antenna cannot be installed in a confined space, as this may affect signal reception.

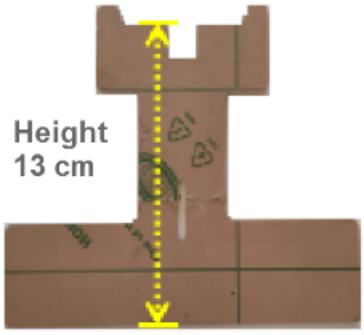
5. Installation and Calibration of Optional Components

5.1 Installation of ADAS Camera

Locate the marking line for sticking ADAS according to the method shown in the figure below, to determine the installation position of ADAS.



With the special bracket for ADAS fixation, clamp the camera at the bottom of the windshield at 90° perpendicular to the edge of the center pillar. Tear off the 3M adhesive film on the ADAS camera. Align the camera with the notched ADAS fixing seat of the bracket. Finally, press the camera onto the glass gently and continuously.





5.1.1 ADAS Camera Calibration

After the system cables are connected, ignite and turn on the M1N main unit. The ADAS camera is identified, and channel 1 is set as ADAS channel by default.

*5m calibration method

1. Get off and measure the height of the ADAS camera. Erect a 5m ruler for ADAS calibration.

1.Check if the ADAS glue is complete fitted ,cannot appear bubbles





2. Mesure the height of the ADAS camera lens to the ground.（Ensure that the ruler is vertical to the ground)



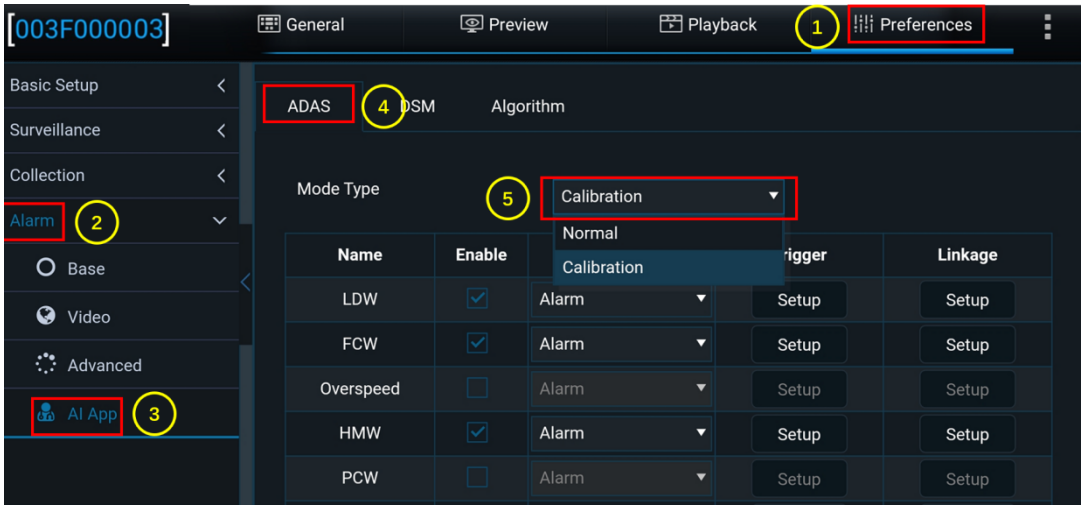
3.Mark the 5M distance in front of **vehicle**

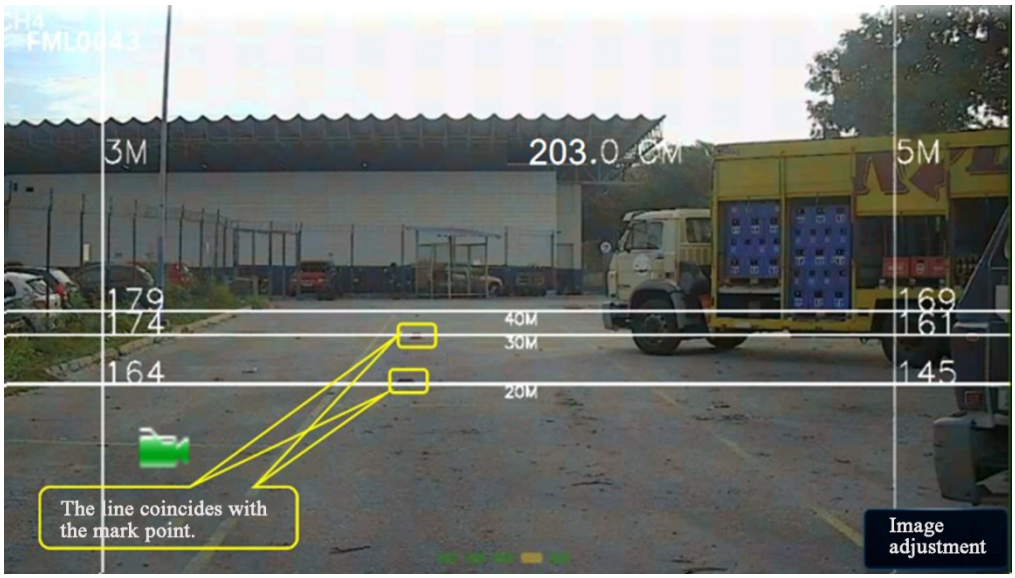
* Long-distance calibration method (20m/30m calibration: If conditions of the installation site permit, the long-distance calibration method is recommended.)

① Place a marker at 20m/30m (measured with a tape measure) away from the ADAS camera lens in front of the vehicle.

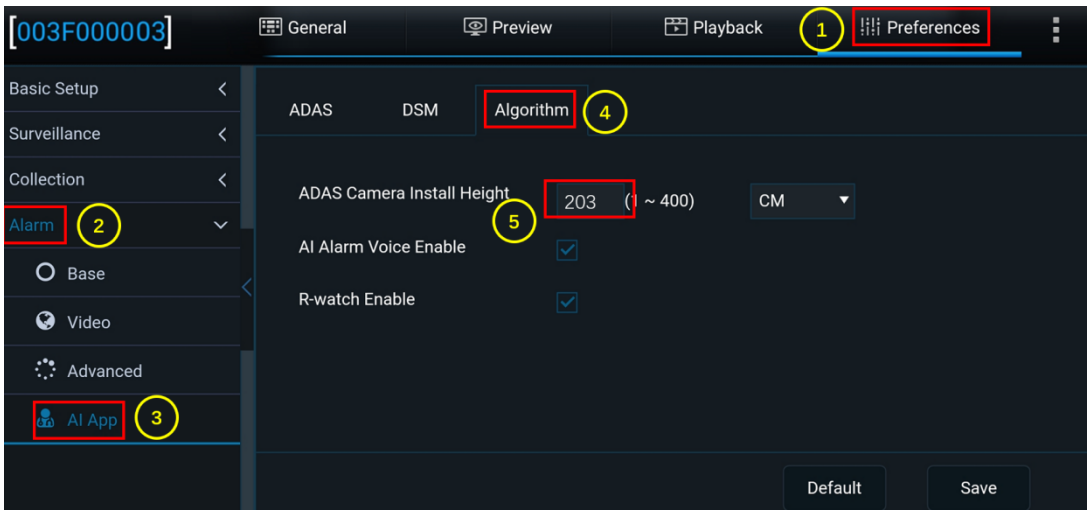


② In the EasyCheck App, set ADAS as the calibration mode, and then adjust the camera lens through real-time preview to make the 20m/30m line in the screen coincide with the marker.





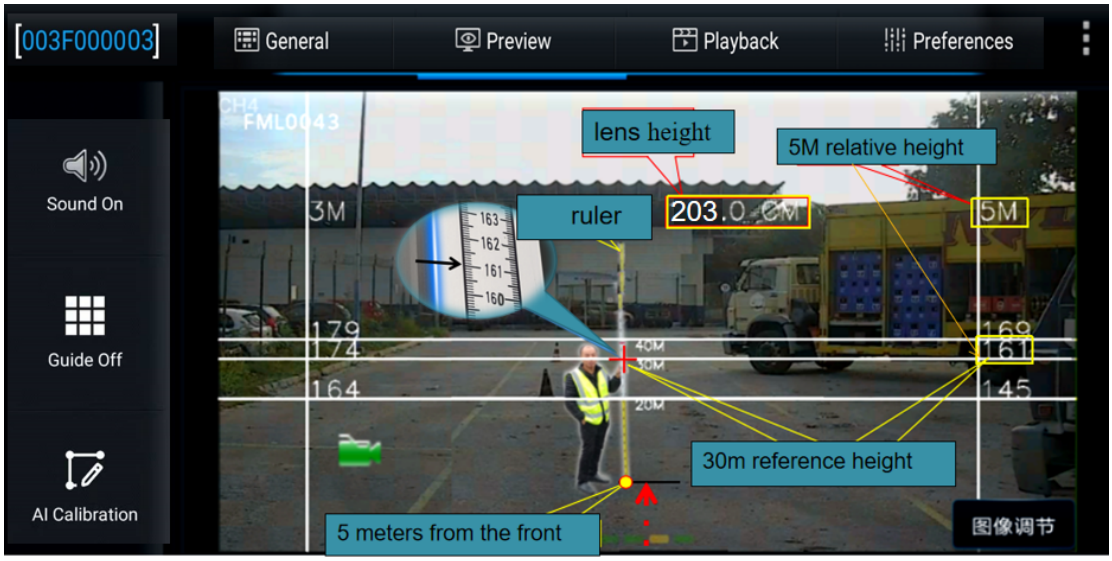
2. Set the calibration value for the ADAS camera as follows: Click Parameter Setup > Alarm > AI App > Algorithm in sequence, and then enter the ADAS calibration height.



3. Adjustment of lens height in the ADAS camera calibration screen



4. Operation setup after ADAS camera calibration



1.This is 5M calibration method. Erect a ruler in front of vehicle， make a highlight mark on ruler at the relative height (161 cm).

2.Adjust the ADAS lens， align the 30M line with the highlight mark on the rule.

5.2 Installation of DMS Camera

Requirements for installation position:

1. If the A-pillar camera (recommended as CA29M in general) is selected, the DMS camera shall be installed on the A-pillar on the driver's side, with the side facing the driver's face.
2. The DMS camera lens shall be 80-110 cm away from the driver's face.
3. The installation height of the DMS camera on the A-pillar shall be flush with the driver's face.



Requirements for installation angle (auxiliary adjustment through real-time preview screen after the equipment is powered on):

1. Adjust the angle of the DMS camera up and down, and left and right, to ensure that the driver's face appears in the middle of the video screen and the lower edge of the screen is below the driver's chest.
2. Make sure that the fill light of the DMS camera faces toward the driver's face (the fill light shall not face toward the seat belt; otherwise, it will lead to overexposure of video).
3. Make sure that there is no other object (such as steering wheel) in the DMS video screen that will block the driver's face and the seat belt features.

Requirements for installation details:

1. In the event of installation on A-pillar (crescent-shaped CA29M), the labeling surface of the DMS camera must face toward the A-pillar (with the arc side facing toward the driver).
2. In the event of installation on countertop (crescent-shaped CA29M/CL29M), the labeling side of the DMS camera must face down (with the arc side up).
3. After angle adjustment and calibration, the protective film must be removed from the DMS camera, and the DMS camera must be locked with a socket head wrench to avoid shaking up and down, and left and right.



Installation on left A-pillar: with the arc side facing toward the cabin and the wire end at the bottom



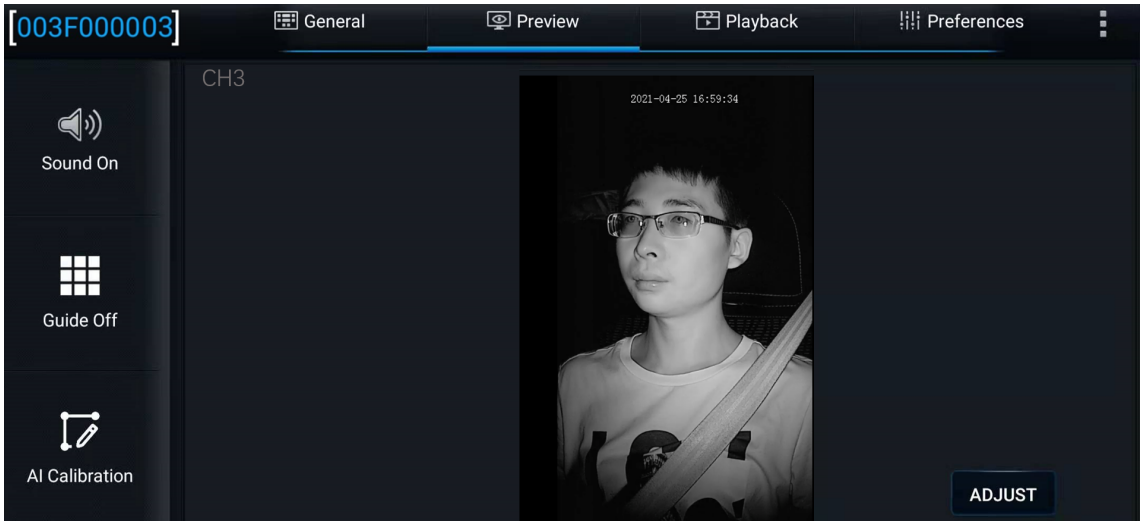
Installation on countertop: with the arc side up



Installation on right A-pillar: with the arc side facing toward the cabin and the wire end at the top

5.2.1 Installation Steps of DMS Camera

1. First, power on the equipment and connect the equipment with the APP. Enter the real-time preview screen, and first check whether the driver stands right side up in the screen when the target installation position and the labeling surface of the camera face toward the A-pillar (with the arc side facing toward the driver).



2. If the driver stands right side up in the screen, there is no need to set the installation type of DMS camera. Directly move on to step 3.

   If the driver stands upside down in the screen, click "Setup", "Surveillance" and "Image Setup" in sequence, and then select corresponding channel of the DMS camera. For example, if the DMS camera model is crescent-shaped CL29M, the camera type here will be "CL29M" by default, and then select the corresponding installation position at "Install Pos":

   In the event of installation on the left A-pillar, select "Left A-pillar".

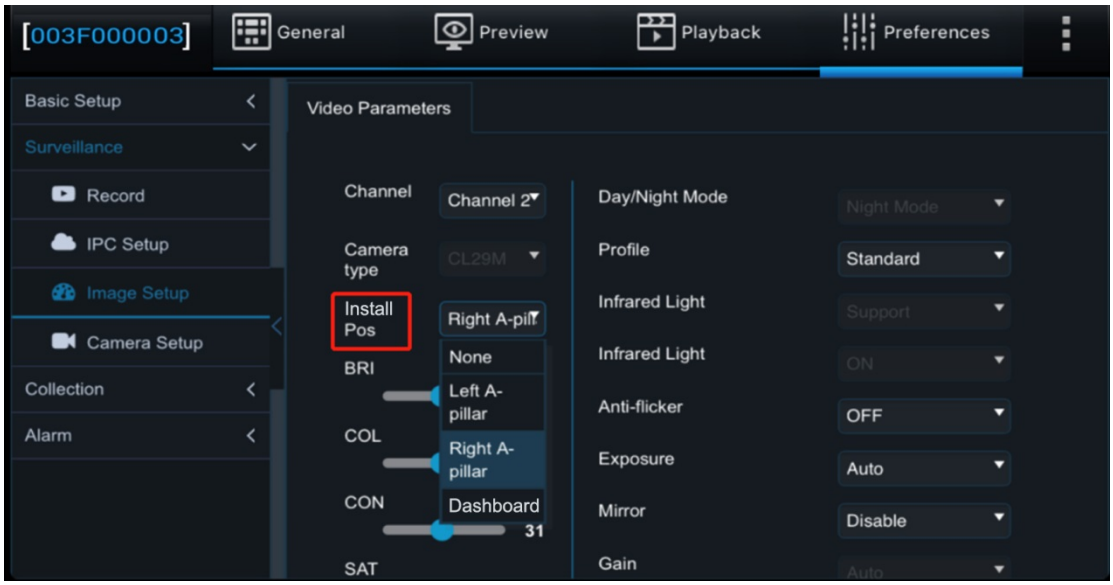
   In the event of installation on the right A-pillar, select "Right A-pillar".

   In the event of horizontal installation of CA29M camera on the dashboard, select "Dashboard".

*Note:

After the corresponding correct installation position is selected according to the installation requirements, if the driver stands upside down in the screen, never adjust the angle by modifying or turning over the mirror image in the image setup.

Be sure to select the corresponding correct installation position at "Install Pos" after selecting the corresponding channel. If your selection is correct, the screen will turn over automatically and normally.



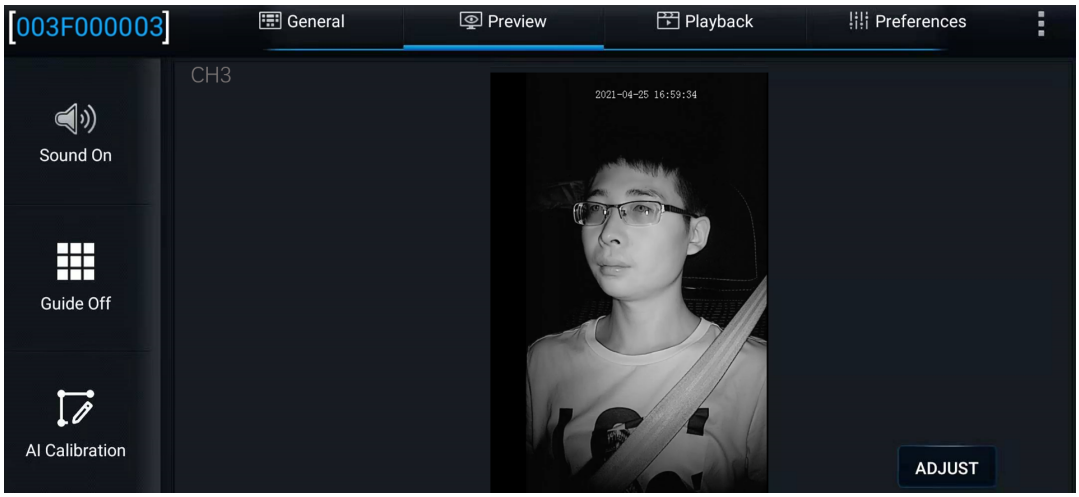
3. After the appropriate installation position meeting the above requirements for installation details is determined through the DMS camera screen, first tighten the upper screw of the DMS camera mount (with the lower screw of the mount not tightened temporarily, so as to adjust the angle of the camera up and down).



4. Adjust the left and right angle joints of the DMS camera through the hexagon socket screws, so as to adjust the angle of the DMS camera left and right.



5. After adjusting the angle of the DMS camera up and down/left and right, make sure that the driver sits according to normal driving habits and posture, to meet the following conditions:
   (1) Make sure that the driver's face appears in the middle of the video screen, and the lower edge of the screen is below the driver's chest.



   (2) Make sure that the fill light of the DMS camera faces toward the driver's face (the fill light shall not face toward the seat belt; otherwise, it will lead to overexposure of video).
   (3) Make sure that there is no other object (such as steering wheel) in the DMS video screen that will block the driver's face and the seat belt features.
6. Tighten the lower screw of the DMS camera mount and the screws at the left and right angle joints to ensure that the camera will not shake up and down or left and right.

5.2.2 Calibration Requirements of DMS

Log in to "EasyCheck App/FT Vision".

1. **Click [Preview] on the homepage to enter the preview interface.**

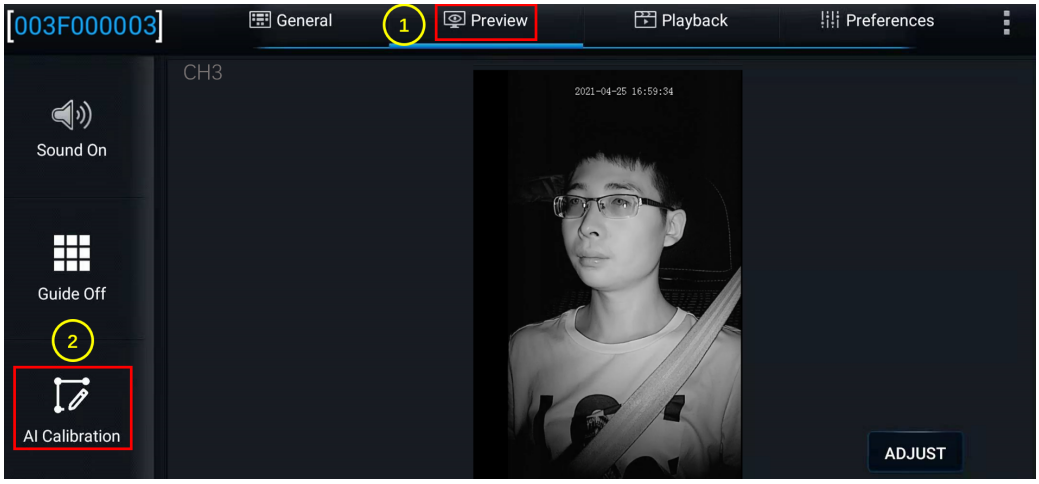
   Double-click the driver channel to enter the main-stream full screen.

   Adjust the angle of the DMS camera so that the driver's face appears in the middle of the screen and the lower edge of the screen is below the driver's chest.

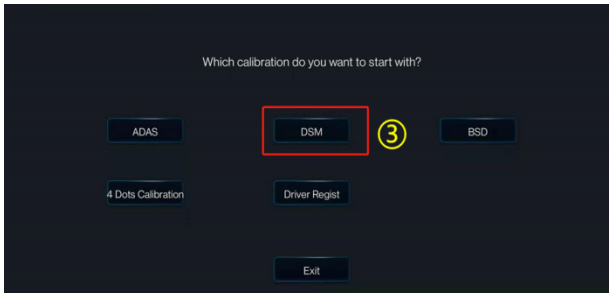
   Make sure that the fill light of the DMS camera faces toward the driver's face (the fill light shall not face toward the seat belt; otherwise, it will lead to overexposure of video).

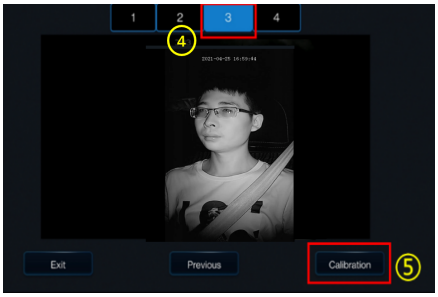
   Make sure that there is no other object (such as steering wheel) in the DMS video screen that will block the driver's face and the seat belt features.

2. Click [AI Calibration] for calibration selection.

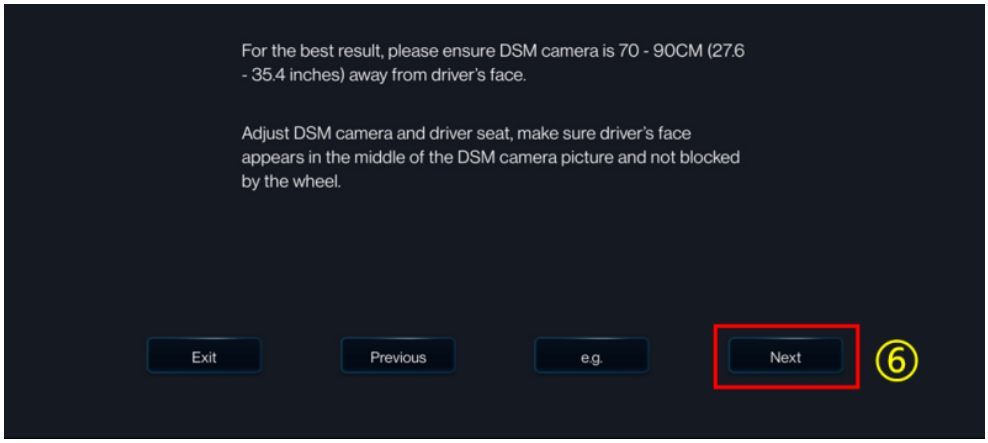


3. Select [DMS] for calibration.
4. Select corresponding channel of the DMS camera (select channel 3 here).
5. Click [Calibration] to move on to the next step.





6. Confirm the prompts — click [Next] to move on to the next step.

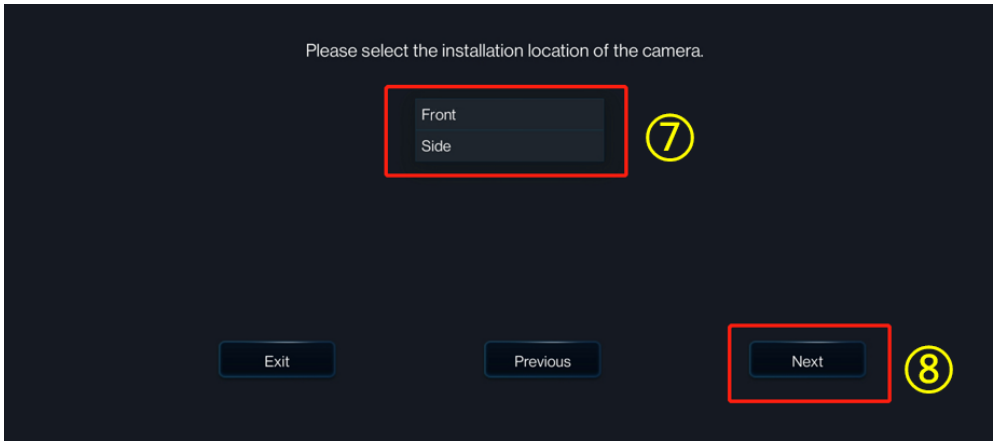


7. Select [Front] or [Side] to determine the installation method of DMS camera.

   If the camera is installed on the A-pillar, select "Side" for side calibration.

   If the camera is installed right in the middle of the dashboard, select "Front" for front calibration.

   (Make sure the correct one is selected, as this step is very important.)



*Note:

Before clicking [Next] to start formal calibration, the driver shall sit in the normal driving posture and look straight ahead.

Never select front calibration if side installation is selected. The driver shall turn the head sideways to face toward the camera to complete the calibration.

8. Click [Next] to move on to the next step for automatic face calibration.

   During calibration, make sure that the driver sits still according to normal driving habits and posture and looks straight ahead.

   In the process of side calibration, the intelligent algorithm will automatically learn the driver's head deflection angle and the positions of feature data of the driver's face. If the driver moves his head during the calibration, the calibration will restart automatically.

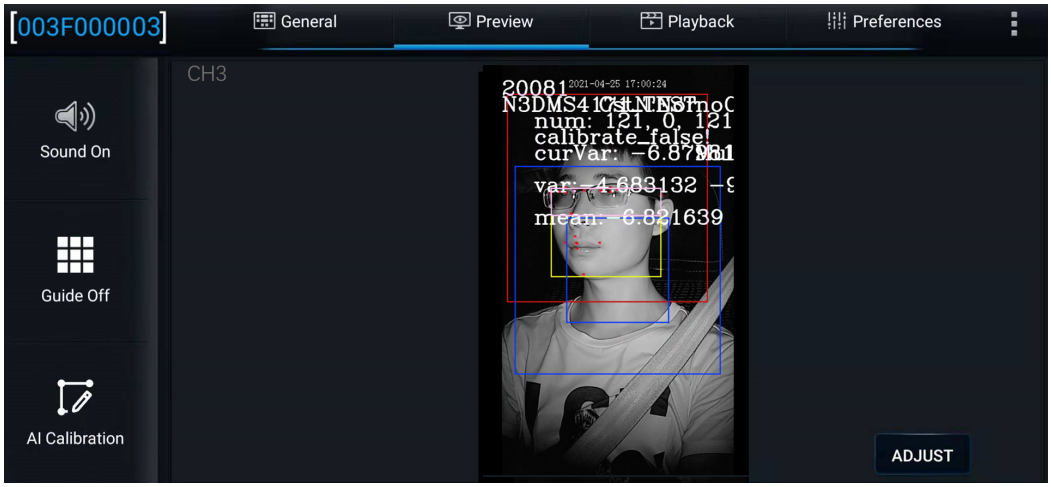
*Note:

In the side calibration mode, there must be an angle between the driver's face and the camera to complete the calibration.

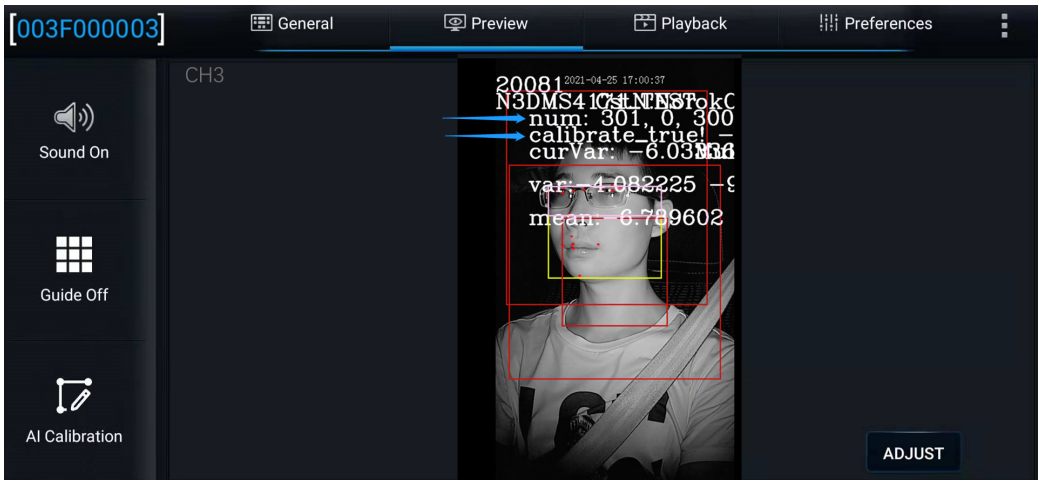
In the front calibration mode, the camera must be in front of the camera to complete the calibration.

The driver sits still and waits for the equipment to be calibrated automatically. When the value of NUM reaches 301 in the mode of side installation and side calibration (51 in the mode of front installation and front calibration), the calibration frame turns from red to blue, and then the automatic calibration ends.

Calibration is ongoing:



Calibration is completed:



Click [Finish] to complete the calibration and exit the calibration mode.

5.3 Installation of Side BSD Camera

5.3.1 Installation Requirements of Side BSD

1. Applicable model

The side BSD system is suitable for rigid carbody. (The compartment and the vehicle head are integrated, while the non-trailer compartment can be at different angles to the carbody.)

2. Requirements for installation position

(1) The BSD camera is suitable for installation at the left/right tail of the carbody. The lens shall face forward and be installed at the height of 195 cm±15 cm to the ground.

(2) The BSD camera must be installed vertically.

(3) The installation position of BSD camera on the carbody shall be flat without any inclined arc surface, and be convenient for drilling and wiring.



3. Installation details

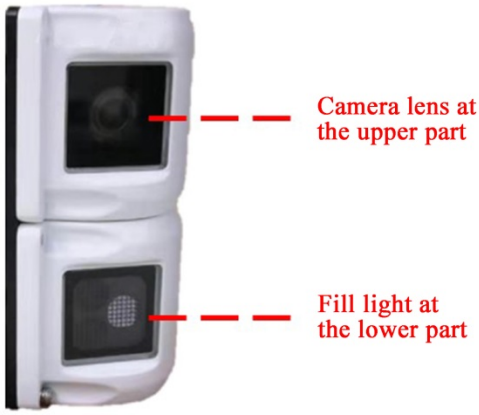
(1) The side BSD camera can be installed on the left or right side of the carbody. Although the cameras used are of the same specification and model, they can be of different structures to match different sides of vehicle.

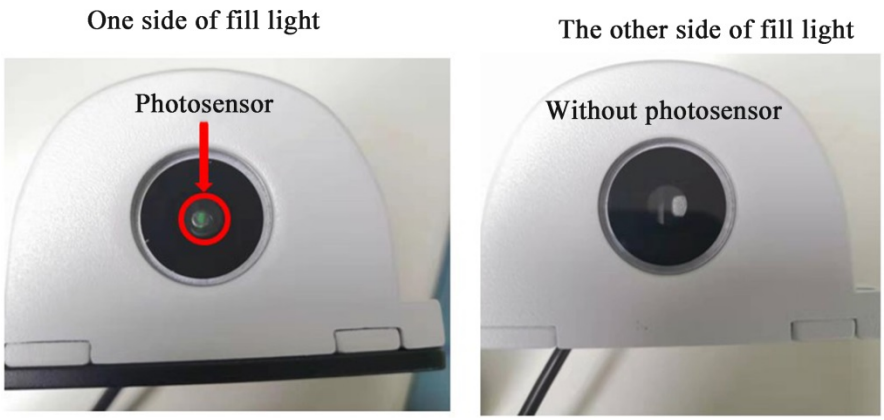
As shown in the figure below, "B" is in the red circle of the label, indicating that the camera is installed on the right side.

As shown in the figure below, "A" is in the red circle of the label, indicating that the camera is installed on the left side.

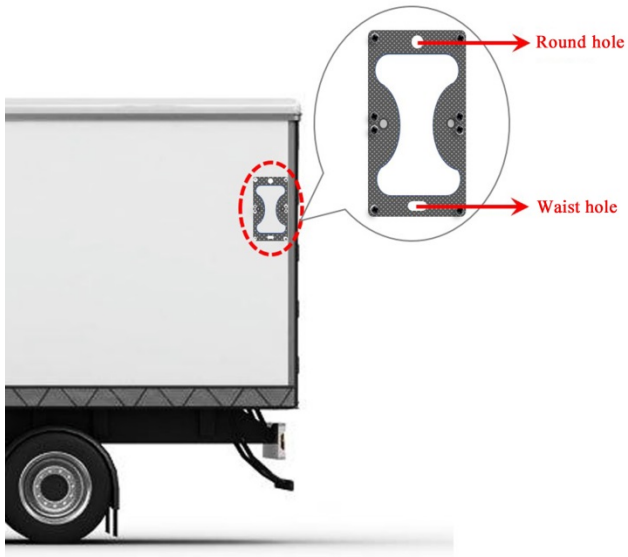


(2) The BSD camera consists of two parts: lens and fill light, so it needs to be assembled. The camera must be assembled with the lens at the upper part and the fill light at the lower part, regardless of left or right camera. Moreover, the photosensitive side of the fill light must face down.





(3) During installation of the BSD camera, the BSD camera base can first be installed with the round hole at the upper part and the waist hole at the lower part (so as to facilitate adjustment left and right, and thus ensure the vertical installation of BSD).



5.3.2 Installation Steps of Side BSD

1. Park the vehicle on the flat ground.
2. Select the appropriate installation position according to the actual situation of the vehicle, and install the BSD camera at the left/right tail of the carbody, with the installation height of 195±15cm to the ground (during installation, consideration shall be given to convenient drilling on the carbody and easy arrangement of outgoing line in the vehicle).
3. At the selected installation position, drill the first hole with a 2.8mm drill bit, and then properly fix the camera mount. Make sure that the round hole is at the upper part and the waist hole at the lower part, as shown in Fig. 1 below.
4. Align the mount with a level, and drill the remaining three screw holes. At the same time, drill a tail harness inlet hole for the camera at the appropriate position with an 18mm tapper, and then apply glass sealant to the screw holes on the carbody. Finally, tighten the mount screws, as shown in Fig. 2 below.
5. Fix the camera on the mount (first apply excessive glass sealant to the inlet hole), and measure the installation height of the lens, as shown in Fig. 3 (at the height of 203 cm) below.

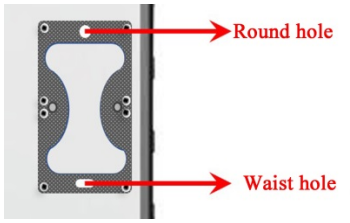


Fig. 1



Fig. 2

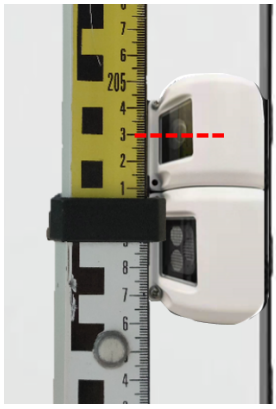


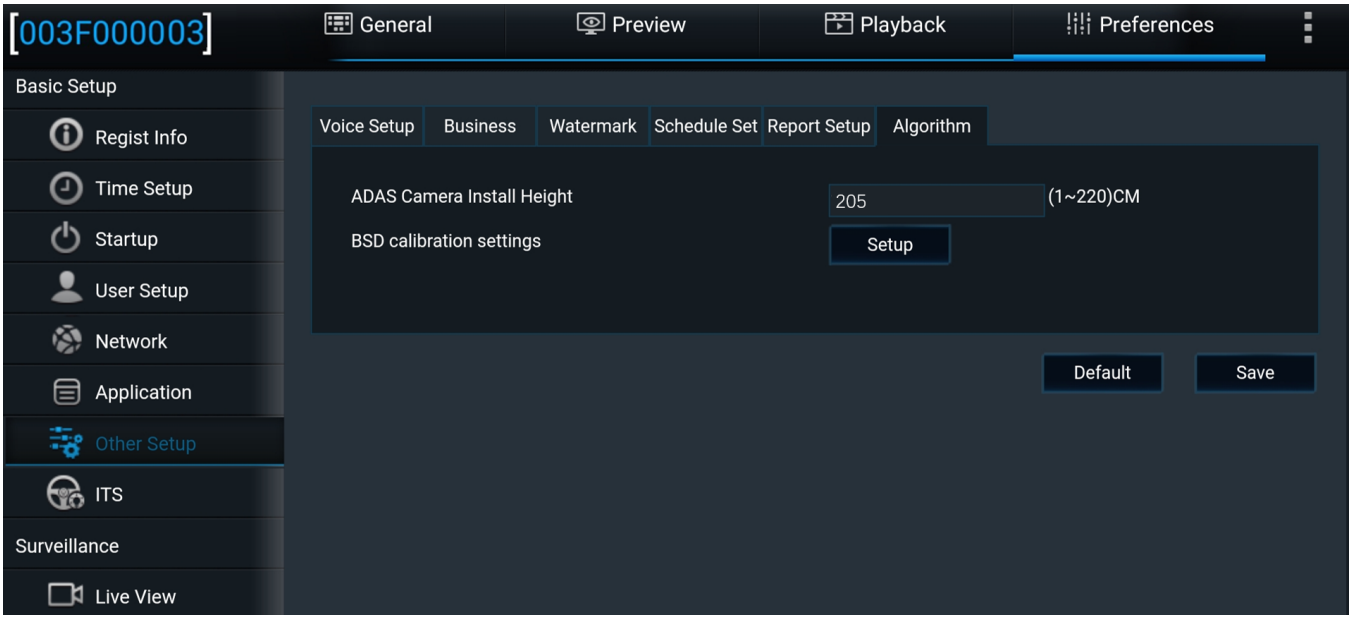
Fig. 3

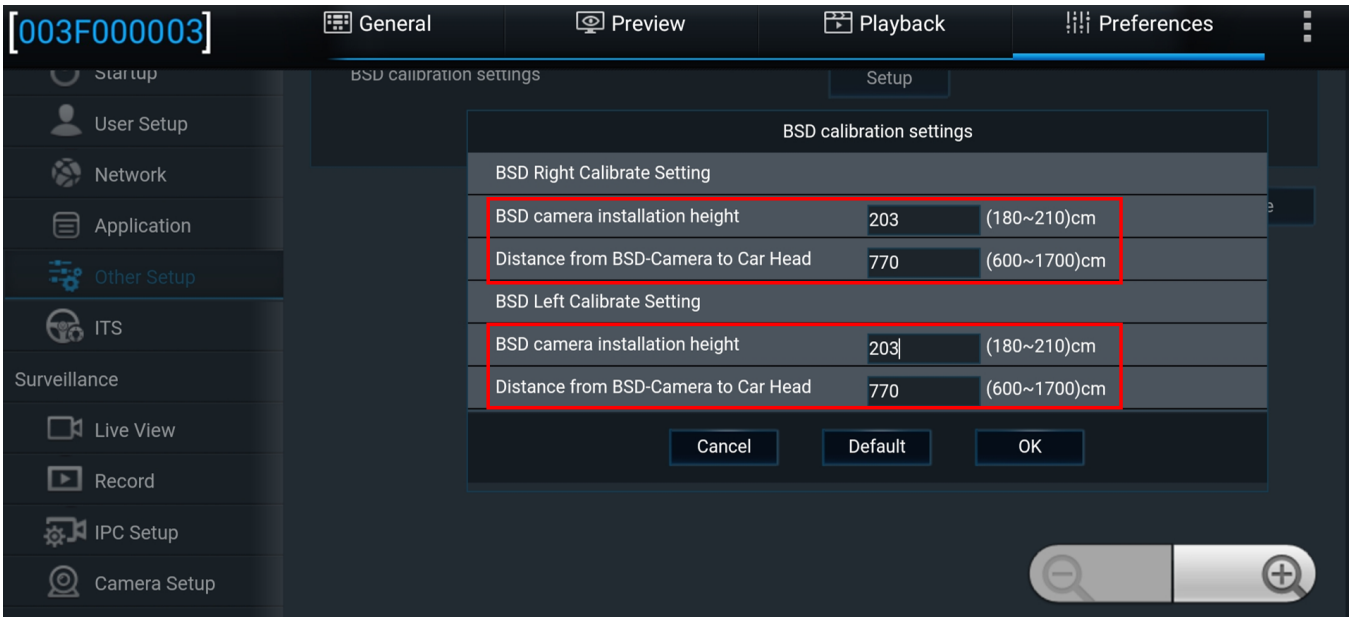
5.3.3 Calibration of Side BSD

1. Measure the distance between the point of the BSD camera lens relative to the ground and the vehicle head and the installation height of the camera (i.e. height from the camera lens to the ground, accurate to cm).



2. Click "Setup - Basic Setup - Other Setup – Algorithm – BSD Install Height" in sequence, and then enter the following two values: distance between the point of the BSD camera lens relative to the ground and the vehicle head, and installation height of BSD camera.



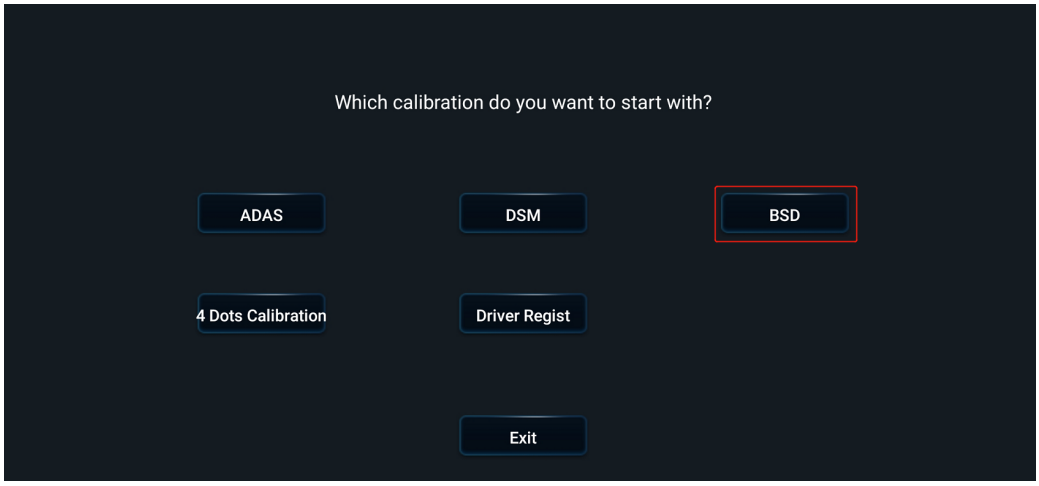


3. Place a marker close to the side of the vehicle at 2m in front of the vehicle head, as shown in the left picture below.
4. Start and connect the equipment, and preview the picture through the EasyCheck App, as shown in the right figure below

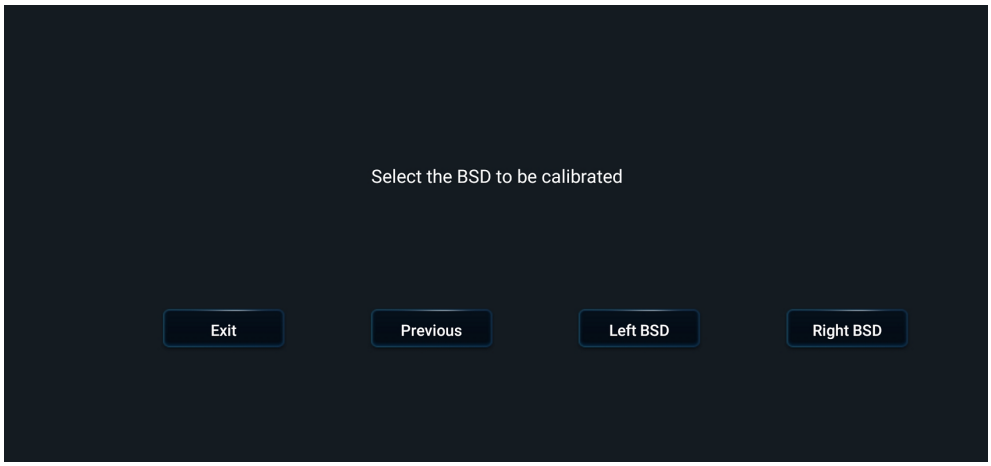




5. On the preview interface, click "AI Calibration" and select "BSD Calibration", as shown in the figure below:

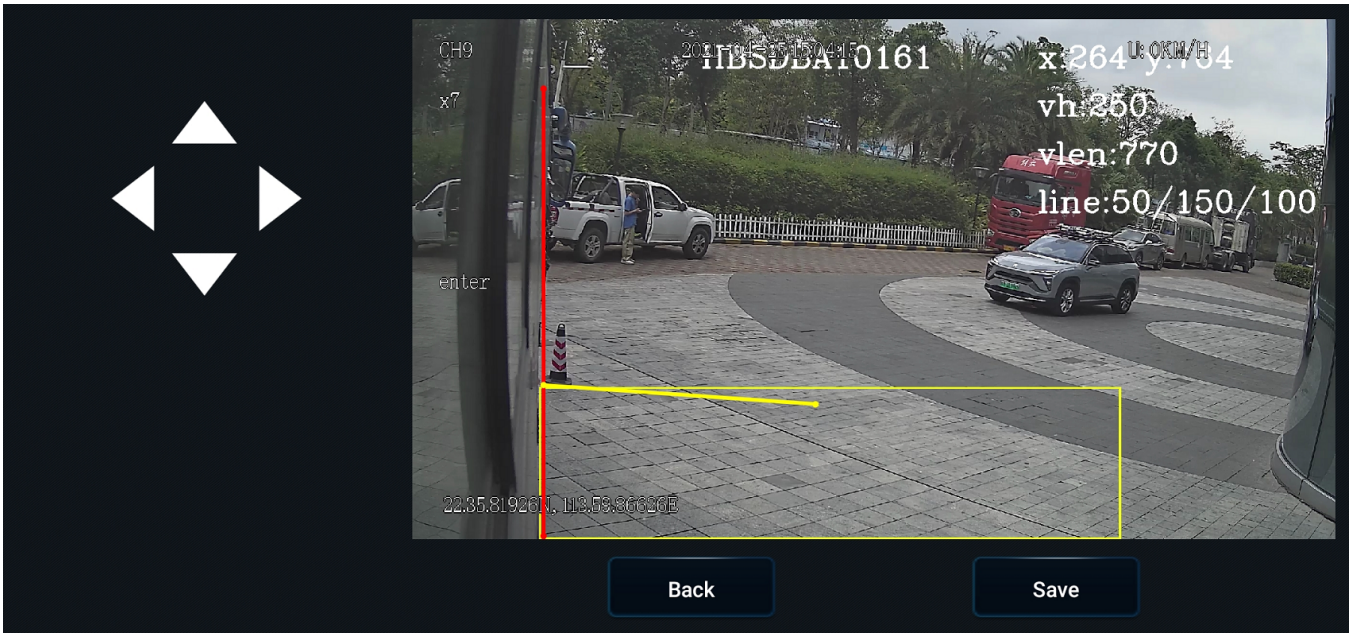


6. Select the left or right BSD to be calibrated, and enter the real-time preview screen. Here, take the right BSD as an example.





7. On the real-time preview screen of BSD, click "Calibration" at the bottom of the real-time screen, At this point, a red vertical line, a yellow horizontally inclined line and a yellow box appear on the screen, and "Up", "Down", "Left" and "Right" buttons appear on the left side of the screen:



8. Click the "Left" and Right" buttons on the left side of the screen to move the "red vertical line" in the real-time screen until it just fits the edge of the carbody, and then click the "Up" and "Down" buttons to move the "yellow inclined line" in the real-time screen until it just coincides with the mark point on the ground at 2m away from the vehicle. (As shown above, the "red vertical line" coincides with the edge of the vehicle in the screen, while the "yellow inclined line" coincides with the traffic cone mark point on the ground at 2m away from the vehicle.)

   Confirm that the "red vertical line" and the "yellow inclined line" fit corresponding edges well, and then click "Save". Return to the real-time preview screen.

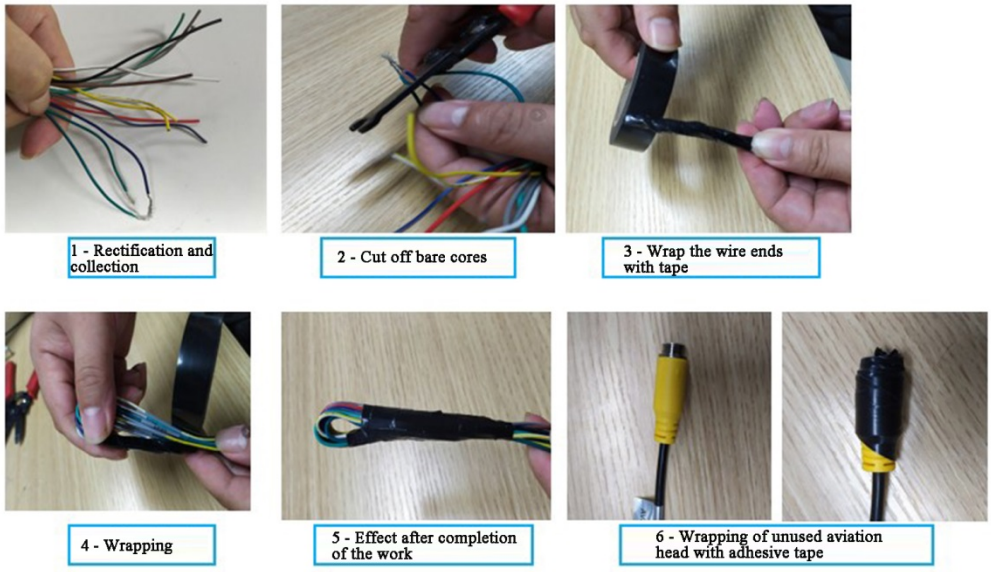
At this point, the BSD calibration ends, and the alarm speed threshold can be changed to 0 to test the alarm trigger.

6. Process Requirements

6.1 Treatment Standard of Unused Connection Wire Ends

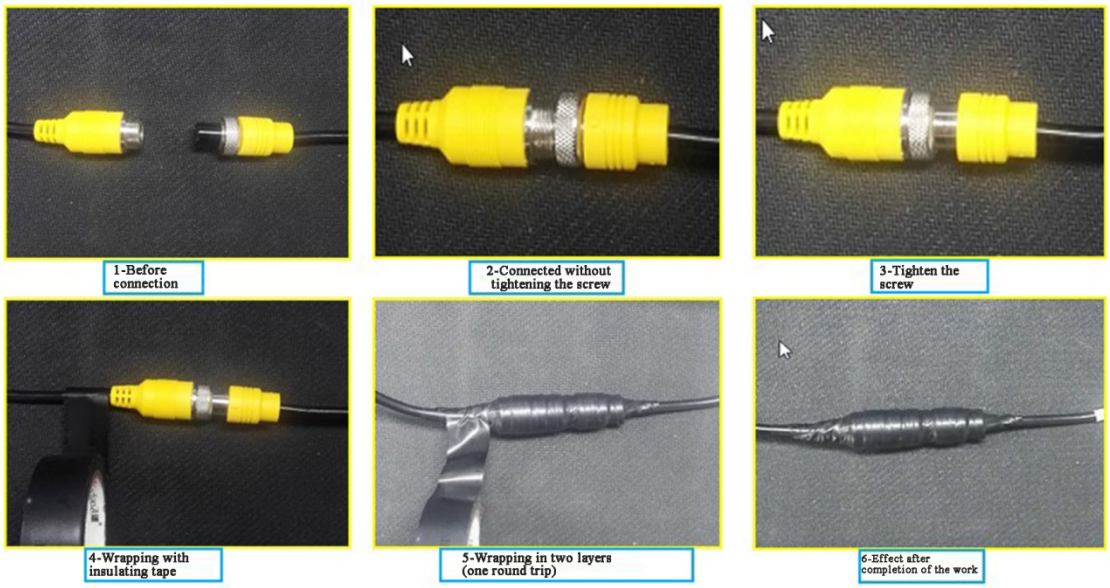
1. All unused signal connection wire ends must be wrapped. Refer to the figure below for the standard treatment process requirements.
2. Unused aviation connectors must also be wrapped.

Basic Process Requirements - Protection Process Standard Requirements for Unused Wire Ends and Aviation Connectors



6.2 Connection Process of Aviation Connector

Basic Process Requirements - Connection Process of Aviation Connector



6.3 Requirements of Opening for Wiring

6.3.1 Interior Opening for Wiring of Vehicle

① If the mode of opening for wiring is adopted, a rubber sleeve shall be additionally set at the opening to protect the cables from being worn out by the sharp part of the opening.

② To ensure aesthetic wiring, the mode of concealed wiring where possible and arrangement of surface wiring in corrugated conduits shall be adopted.





6.3.2 Exterior Opening of Carbody- Opening for Installation of Tail Harness of Camera

The two requirements described in 6.3.1 shall be met. In addition, waterproof adhesive shall also be applied at the opening to prevent rainwater from entering the vehicle.





① At the screwing part of camera and the opening for installation of tail harness on the exterior of the carbody, glass sealant shall be applied for waterproofing.

② For the purpose of aesthetics, the color of glass sealant shall be the same as or be similar to the carbody.

7. Acceptance and Cleaning

7.1 Cleaning

Clean up the installation site, collect and take away tools and waste separately, and put the original articles in the vehicle to their original place, and then the installation work ends.



7.2 Installation Acceptance

1. Conduct acceptance for the installation details and parameter setup item by item according to the acceptance list provided by the customer.

   (1) Focus on inspection of parameter setup, and save screenshots.

(2) Focus on inspection of video images, and capture and save videos.

(3) Allow the driver to drive the vehicle for a short distance to check whether the ADAS/DMS/BSD camera functions normally.

2. Take pictures of all the equipment and the center console after installation.

(1) Take pictures of the installation positions of all items.

(2) Take a picture of the rendering inside the cabin after installation.