

Installation Guide VT3500

Foreword

This **VT3500** Installation Guide has been prepared to help engineers to install the camera and its accessories properly and quickly, and to improve the overall efficiency of the installation.

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

Important Instructions

1. Before installation, please park the vehicle on flat ground and turn the ignition off (do not park the vehicle on a ramp or an inclined road).
2. Please read the contents section carefully and check everything is included at the time of unpacking.
3. Please carefully note the list of tools required before product installation.
4. Before installation, please follow the principles below:
 - a. The installation position and wiring of the product shall neither impact the driver's view nor impact the adjustment of the rearview mirror and sun visor;
 - b. The camera lens for monitoring the road conditions ahead 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 needs to be accessible for the replacement and maintenance of the Micro SD card and SIM card.
5. The appropriate installation method shall be selected according to the specific vehicle, and this document is for reference only.
6. The appropriate power supply connection required shall be selected according to the specific vehicle. Connecting to the vehicle power supply should only be performed by trained personnel, and this document is for reference only.
7. When installing in a specialist vehicle, please contact the product supplier for support.
8. **8.Veyes App** is required to debug and configure the **VT3500** 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 **VT3500** for related operations according to the prompt on the interface of the APP.



iOS (Apple Store)



Android (Google Store)

System Overview

Product Overview

The **VT3500** is a dual-camera with an integrated intelligent Digital Video Recorder (DVR), designed for driver monitoring and safety risk control. The camera has the added advantage of being simple to install with comprehensive features.

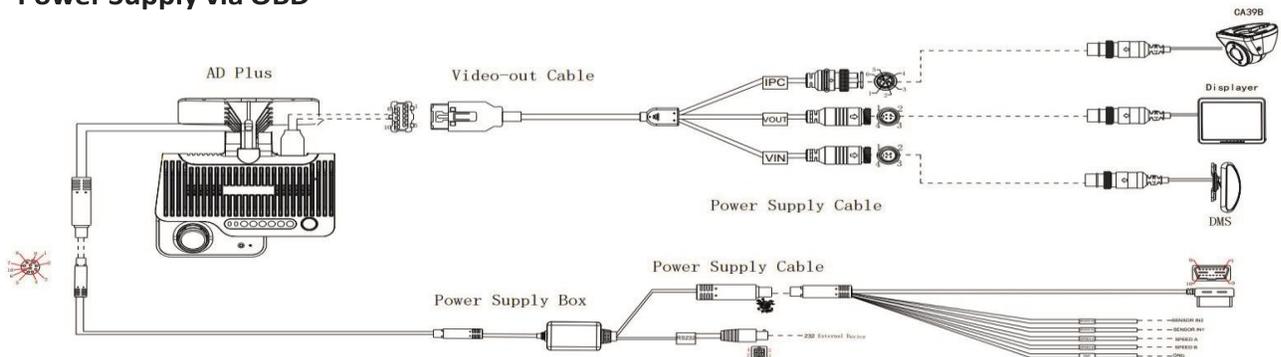
The **VT3500** uses deep learning technology and features an advanced driver-assistance system (ADAS) and intelligent cockpit, effectively identifying hazards such as front collision, tailgating and lane departure, as well as intelligently identifying unsafe driver behaviour such as mobile phone and seat belt use whilst driving. With a DMS camera or BSD camera, the product can further assist with driver status monitoring or blind spot pedestrian detection. With intelligent auxiliary functions, this product can identify potential risks in real time and warn drivers to avoid them, thus effectively reducing the risk of accidents.

The product is suitable for most weather conditions including day and nighttime use, rain and snow, and can be installed on buses, taxis, private cars, passenger vehicles, freight vehicles, dangerous goods vehicles, school buses, tipper trucks, refuse collection vehicles and most other types of vehicles.

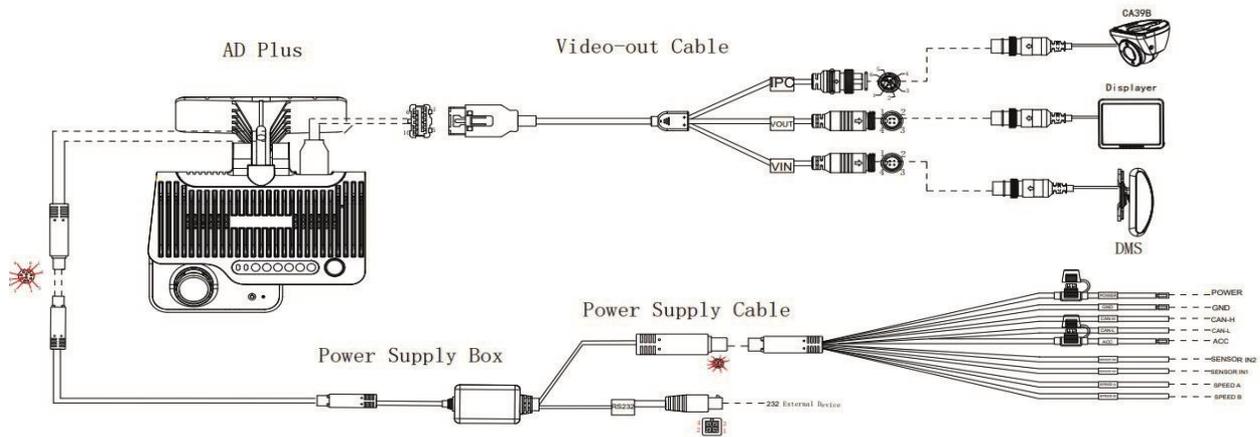
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Schematic Diagram of System Connection

Power Supply via OBD



Power Supply through Internal Vehicle Wiring



Understanding of the Installation Environment

Before installing the camera, technicians should have knowledge of the vehicle model in question, the installation position of the main unit and auxiliary cameras connected to the DVR, the type and length of cables required for each vehicle model, and a list of common auxiliary materials to ensure successful installation and commissioning.

Confirmation of Vehicle and Vehicle-related Electrical Information

Confirmation of vehicle information is the basic precondition of a successful installation will avoid any damage to the vehicle. For each component, proceeding to the next step is only recommended after clear confirmation, and each operation shall be confirmed by the person in charge of the vehicle installation.

1. Check the appearance and interior trim of the vehicle for any damage.
2. Check whether the vehicle ignition works normally.
3. Check whether the vehicle power supply system is in a good condition.

**Note: Confirmation of the above information is crucial. Installation can only be carried out after the above information is confirmed as normal.*

Power Supply Connection of Vehicle

The **VT3500** has two power supply connection modes:

1. Quick plug-in type power supply connection via the OBD interface: This mode is suitable for quick self-installation. For details of this power supply mode, please refer to the accompanying **VT3500** Product Manual in the packing box. It will not be detailed here.
2. Power supply connection through the vehicle's internal wiring: This mode requires operation by specialist installation personnel. The following mainly describes the mode of connection to the vehicle power supply according to the power cable requirements of the product.
 - a. Required tool: multimeter.
 - b. Selection of power supply connection position
 - c. When the vehicle ignition is turned off, use a test monitor to detect

- d. whether the circuit is live. If it is live, it is judged as a constant power supply, and then measure the voltage.
 - e. When the vehicle ignition is turned off and is in ACC position or ignition state, use a test monitor to detect whether the circuit is live. If it is electrically neutral in ignition off 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**
- a. Constant power supply: When the vehicle ignition is turned off, 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.
 - b. 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 a wrong connection.*

Connection of Necessary Signal Cables

Where required, the following signal cables must also be connected to enable the intelligent assisted driving functions of the **VT3500**:

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 a vehicle maintenance engineer for the specific position of the 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.*

List of Installation Materials and Tools

Inspection as per Packing List

After unpacking the contents, please check the DVR is not damaged and whether the accessories are complete.



Preparation of Installation Tools

Before installation, the following installation accessories and tools should be made available to use:

	Torsion drill	Tighten Screws	1x
	Common screwdriver	Tighten screws; optional socket set	1x
	Trim tools	Pry open the vehicle panel	1x
	Cable ties	Bundle cables together	Several
	Dry cleaning cloths	Clean the counter top	1x
	Smartphone/tablet	Install the EasyCheck App for video preview and parameter configuration	1x
	Measuring tape	Measure the installation height of the forward-facing ADAS camera lens	1x
	Marker pen	Mark lines for main unit installation	1x
	Pliers	Cut and strip wires	1x
	Insulated rubber tape	Wrap ends of wire	1x
	Scissors	Cut insulated rubber tape	1x
	USB flash drive	Standby	1x

	Multimeter	Locate vehicle power supply, measure the conduction of harness, measure pulse signal	1x
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	3M adhesive tape	Fix DMS camera	1x
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The following installation tools are also required for the installation of the DMS camera if required:

	Phillips Screwdriver	1. Adjust and fix the DMS camera lens at a certain angle (generally included in the DMS camera packaging) 2. Tighten the lens screws for ADAS calibration	1x
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	3.5mm*25mm self-tapping screws	Fix camera in position (generally included in the DMS camera packaging)	4x
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The following installation tools are also required for the installation of BSD camera :

	Wire strippers	Strip and cut wires, and cut ties	1x
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	Multimeter	Locate vehicle power supply Measure the voltage of the vehicle	Several
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	Screwdriver socket set	Fix bracket and camera	1x
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	30m tape measure	Ranging and calibration	1x
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	Electric hand drill	Drill holes on the vehicle body	1x
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	High-speed steel drill bits	Drill holes on the vehicle body 3.4mm and 3.8mm drill bits	1x
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	Tapper	Drill holes on the vehicle body for the concealed installation of the tail harness 18mm and 20mm drill bits	1x
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	A piece of steel wire	Help pass wires through holes	1x
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	EasyCheck App	Calibrate camera	1x
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	Ties	Put harness in order	1x
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	3M insulated rubber tape	Connection insulation	1x
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Preparation of SIM Card and Micro SD Memory Card

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

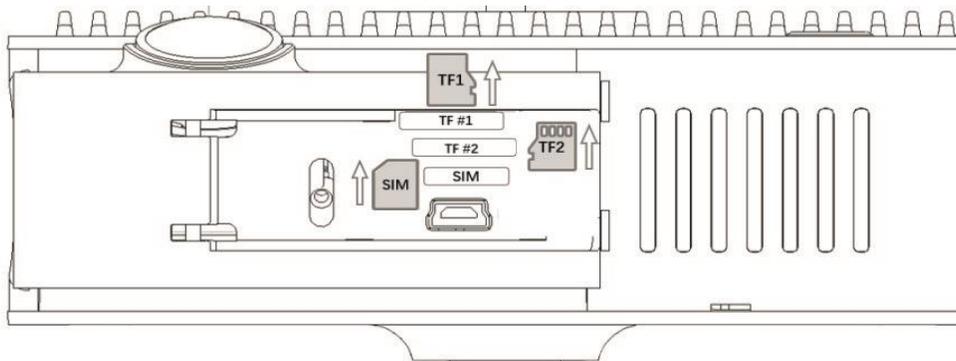
Installation of the VT3500

Installation of the SIM Card and Memory Card

Remove the main unit (without turning power on), and turn the card slot panel at the bottom of the main unit counterclockwise with the Allen key in the package to open the panel.

Install SIM card and Micro SD card as shown in the figure below (note the direction the cards need to be inserted).

These should be inserted without any resistance and should click when pushed in fully, indicating that the cards are installed in the correct direction. If there is obvious resistance when inserting cards, this means that they are the wrong way around. Remove the cards to avoid any damage to the cards or the card holder.



***Note:**

1. Do not touch the metal contact of the SIM card when installing to avoid contaminating with dust, and, or sweat.
2. Before installing the SIM card, please check the surface of the metal contact of the SIM card for any dirt (such as dust, fingerprints and water stains). Clean the surface with a piece of non-woven fabric or rubber if there is any dirt present.
3. In Micro SD card slot 1, the Micro SD card should be inserted with the metal strip facing down; in Micro SD card slot 2, the Micro SD card should be inserted with the metal strip facing up. After installing the SIM card and Micro SD card, tighten the card slot panel.

Selecting the DVR installation location

Installation location for the **VT3500**:

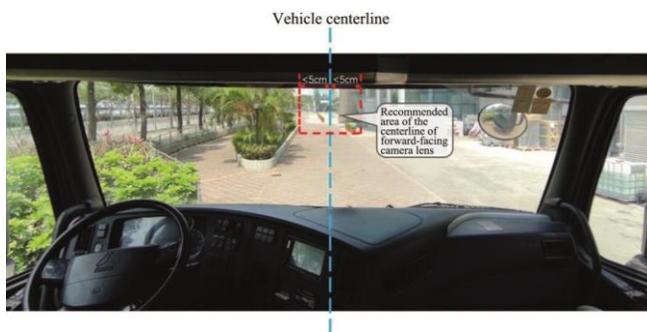
1. The DVR must be installed in the middle of the front windscreen, generally in the rearview mirror area above the centerline of the front windscreen. If this is not possible, it can be

positioned either 5cm to the left or right (the middle of the windscreen is calculated using the middle of the forward-facing camera lens as a marker).

2. The external camera lens of the DVR must be located within the working range of the left and right windscreen wipers as required (make sure that the screen of the external camera lens is clean and free from any dirt or dust particles).
3. The optimum vertical height of the external camera lens of the DVR to the ground should be 130cm-240cm.

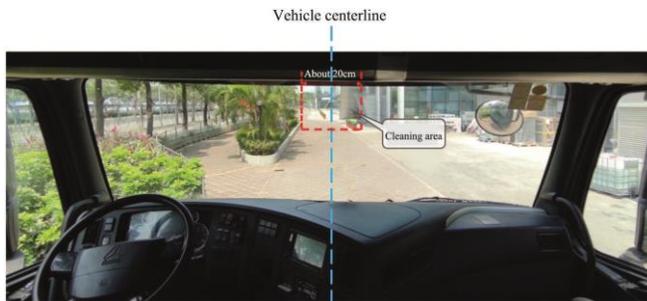
The installation position shall be determined in such a way that the DVR will not hinder the driver from being able to see the front blind spot reflector, and there is no obstruction (such as the interior rearview mirror or glass coating) within the field of view in front of and around the internal and external cameras lens.

The installation area is generally selected as shown in the figure below:



Installation of the DVR Bracket

Clean the interior and exterior of the glass in the installation area with alcohol wipes to ensure that there is no dirt in this area that will affect the view of the external camera lens, and then ensure the glass is dry.



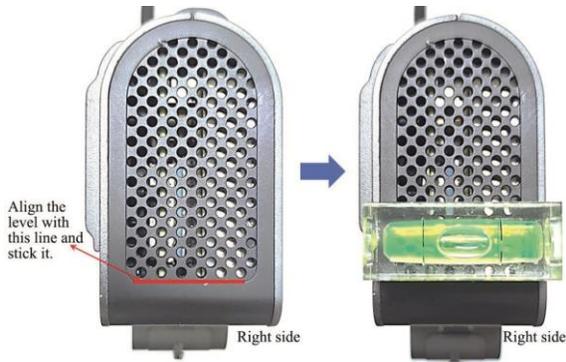
Park the vehicle on flat ground, and then position the spirit level horizontally above the target area (adjust the spirit level to center the bubble).

Position the bracket with the connection facing down (with the toothed side facing left). Peel off the 3M adhesive film on the bracket to position it horizontally on the front windscreen with the level as reference, and then press the bracket for 10s to ensure no air bubbles between the bracket and the glass.

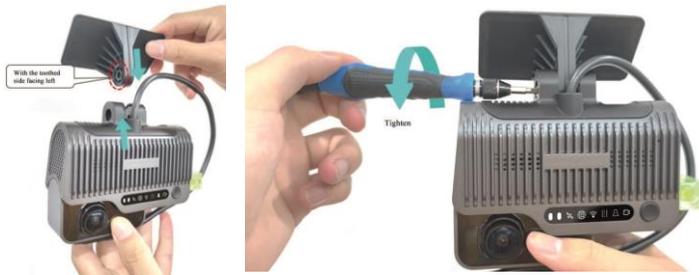


Installation of the DVR

After fixing the bracket horizontally, remove the spirit level, align it and position it on the right hand side of the main unit in the area as shown in the figure below:



Connect the DVR to the bracket with the side facing inward (with the teeth on the left side of the bracket engaged with those on the left inner side of the DVR), and tighten the bracket stud clockwise with a PH2 cross screwdriver (before tightening, first adjust the DVR to make it vertical).

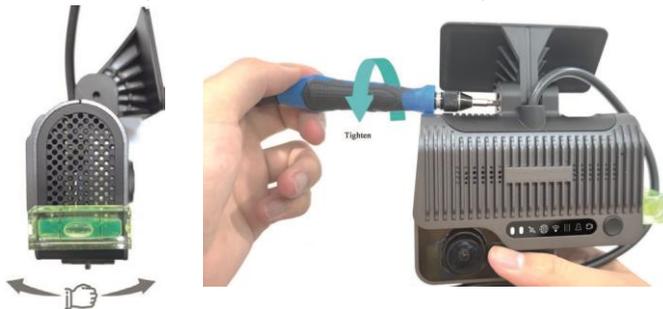


Adjusting and Fixing the DVR

Adjust the DVR back and forth to center the bubble in the level (indicating that the DVR is vertical).

Fasten the bracket stud to ensure that the angle of the DVR cannot be easily changed.

Remove the spirit level and fix the DVR in place.



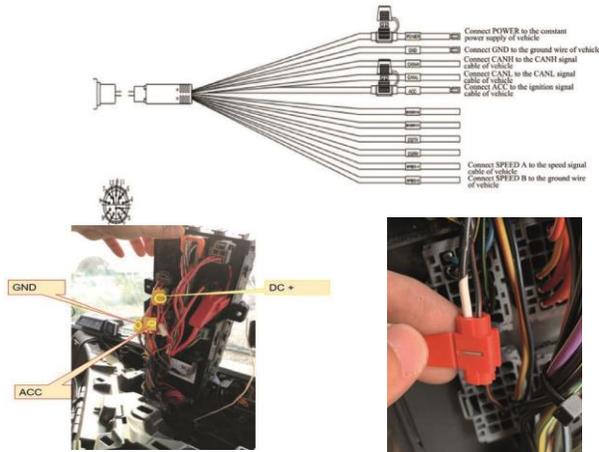
Power Supply Connection, Connection of Signal Cables and Wiring

Power Supply Connection:

1. If connecting to the power supply via the OBD, locate the OBD interface of the vehicle and connect directly.



2. If connecting to the power supply via the vehicle's internal wiring, connect POWER/ACC/GND with the respective vehicle power cable.



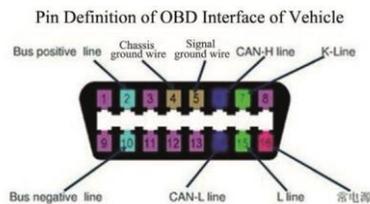
**Note: The power cable should be connected using a "special stripping-free connection terminal" where possible (no stripping is required to avoid the risk of electric shock), the connection should be wrapped with insulated rubber tape to avoid electric shock/short circuit.*

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, it should be taped up with insulated rubber tape to avoid electric shock/short circuit.

Connection of Signal Cables (Pulse or CAN/Left/Right Steering Signal/Reversing) 1. Vehicle speed pulse or CAN (one out of two).

1. Consult a vehicle engineer to locate the vehicle speed pulse cable. Using the **VT3500** power supply cable:
 - i. Connect "SPEED A" to the vehicle speed pulse cable; Connect "SPEED B" to the vehicle ground wire.
 - b. After connecting, login to the Veyes APP to connect the **VT3500**. Enter the configuration interface and set the speed source of the unit as "Pulse". Meanwhile, drive the vehicle for a short distance during installation to test the accuracy of the vehicle speed pulse data.
 - c. **Note: To avoid electrical interference with the vehicle speed pulse a ground wire must be connected.*
2. Consult a vehicle engineer to locate the OBD interface. Generally, the position of the OBD interface is as shown in the figure below. Locate the CAN-H and CAN-L cables of the vehicle behind the OBD interface. Take the standard 16-PIN 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 below is only for illustration.)
 - a. After the connection is completed, login to the Veyes APP to connect the **VT3500**. Enter the configuration interface, set the CAN model and baud rate of the equipment, and set

the speed source as "OBD". Meanwhile, drive the vehicle for a short distance to test the accuracy of vehicle speed pulse data.



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 back cover of the fuse board or using a multimeter.

For standard internal vehicle wiring there are only two IO signal cables, so only connection to the respective left and right steering signals is required.

For non-standard internal vehicle wiring there are eight IO signal cables, so the left steering, right steering and reversing signal cables need to be connected.

**Note: If the measured signal is a pulse signal, the source of left steering/right steering/brake signal should 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 should be set as level on the setting interface of the main unit.*

Wiring:

After connecting the main cables according to the schematic diagram, as well as connecting the power supply and signal cables, arrange these cables using a crow plate according to the diagram below and conceal them in the interior trim panel or the dashboard panel (i.e. concealed wiring).

If DMS camera or BSD camera (optional) are required, the wire length of the DMS camera and the BSD camera can be reserved for wiring at the above-mentioned position.

(1) If connecting to the power supply via the OBD interface or internal vehicle wiring, the wiring method is as follows:



The **VT3500** is equipped with a power supply box which has a built-in switch control. Therefore, the power supply box needs to be fixed to a certain position within the vehicle. Please pay attention to the following tips when choosing the fixed position:

1. Close to the OBD interface or power ports of the vehicle's internal wiring
2. Mount on a flat surface
3. Make sure it does not interfere with other components
4. Position away from vibrating components and motors
5. It is always preferable to keep hidden

Because different vehicle models have different OBD interface positions, the corresponding wiring and the fixed position of the power supply box vary. Here, we recommend two installation positions for the power supply box. You can also fix the power box in other positions according to the actual vehicle model.

Fixing position 1 for the power supply unit:

Remove the side trim in the driver's seat area, peel back the 3M cellophane covering the power supply box and fix it on the left or right side-trim as shown below:



Fixing position 2 for the power supply unit:

The power supply unit will be fixed on the right side-trim in the driver's seat area using visible wiring. We do not suggest installing it on the left side-trim using visible wiring as it might interfere with the car door. When the fixed position has been chosen, peel back the 3M cellophane covering the power unit and fix it to the right side-trim of in the driver's seat area as shown below:



Calibration of the VT3500

ADAS Calibration

Connection using APP

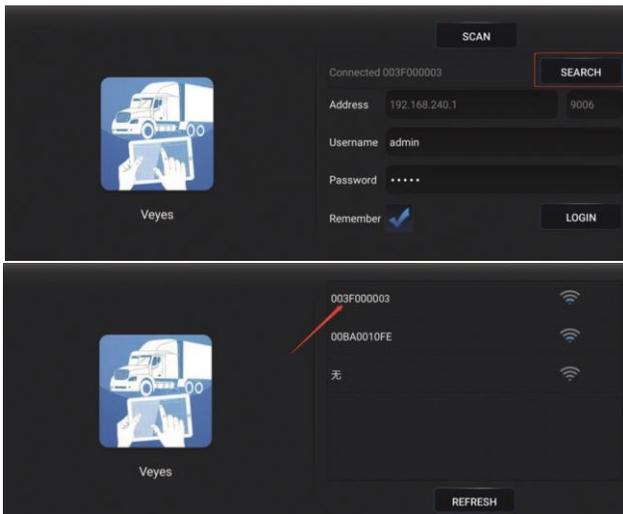
Start the vehicle and wait for the recording and the communication status indicator light on the DVR to light up. When the two indicator lights turn green and are continuously on, it indicates that the DVR is working normally.

Login to the VeyesAPP with a mobile phone/tablet within 2 mins of powering the main unit up. Before connecting the device with the EasyCheck App, please turn on the mobile phone Wi-Fi and GPS.

The **VT3500** will remain in AP mode for 2 minutes after powering up. Turn on the EasyCheck App on your mobile phone, click [Search] to enter the Wi-Fi hotspot search interface. When logging in for the first time, the name of the Wi-Fi hotspot is named by ADplus encryption chip number (generally, ST-xxxxxxx by default). If the number plate has been modified, the hotspot name will be the number plate number. Search for Wi-Fi hotspots named by ADPlus encryption chip number or entered license plate number to enter the login interface.

**Note: Within 2 mins after startup, the DVR will automatically enable the Wi-Fi transmission mode for debugging and connection with the APP. If no connection is established with any APP within the 2 mins time period, the Wi-Fi hotspot of the DVR will be OFF.*

In the login interface, enter the corresponding user name and password and click [Login] to enter the operation interface. The default username/password is admin/admin.



Measure the Installation Height of the ADAS Lens

Using a ruler or tape measure to measure the vertical height (accurate to within 1cm/1 inch) from the ground to the **VT3500** forward-facing lens as the installation height of ADAS lens, as shown in the below image.

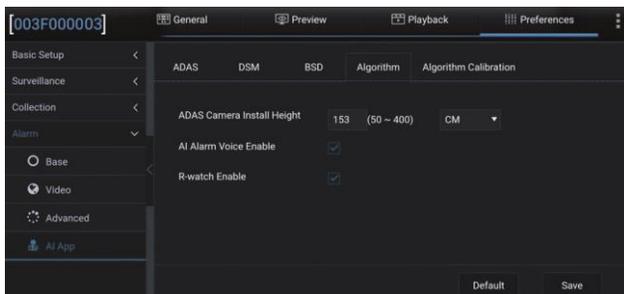
Note: It is necessary to keep the ruler or tape measure upright to the ground before reading the height value.



Calibration of the ADAS Camera Lens

Click [Preferences] > [Alarm] > [AI App] > [Algorithm] after logging on to the Veyes interface as shown below:

The ADAS calibration height can be measured in centimeters or inches. When cm is selected, the range is 50~400cm, and the default is 153cm. When inches is selected, the range is 20 ~ 157 inches, and the default is 59 inches. Enter the height value from the previous step and then click [Save].



Angle Adjustment of Interior Camera

Click [Preview] on the operation interface of Veyes to enter the preview interface and double-click [Channel-2] to enlarge the cabin image.

Open the card slot panel at the bottom of the DVR and insert the Allen Key into the internal camera angle adjustment hole to adjust the angle of the internal camera lens.

Adjust the internal camera lens as follows

- 1. The left and right centers of the cab are in the center of the screen
- 2. The screen of the cabin is horizontal
- 3. The steering wheel of the vehicle is displayed at the left/right lower corner of the screen.



The cabin image after adjustment of the internal camera lens should look like below:



Installation and Calibration of
Acceptance and Cleaning
Cleaning

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