MEITRACK MD500S MDVR User Guide

Change History

File Name	MEITRACK MD500S MDVR User Guide		
Project	MD500S	Creation Date Update Date	2022-01-06 2022-12-20
Subproject	User Guide	Total Pages	22
Version	V2.1	Confidential	External Documentation

Contents

1 Copyright and Disclaimer

2 Product Introduction

2.1 Product Overview

The MD500S is a four-channel mobile digital video recorder (MDVR) featuring high stability and supporting Advanced Driver Assistance Systems (ADAS), Driver Monitoring System (DMS), video recording, and GPS tracking. Adopting the high-performance processor and Android operating system, it can operate in vehicle tracking mode and video recording mode simultaneously and is a core product of new-generation wireless vehicle video surveillance solutions that uses H.264 video compression or decompression, GPS positioning, and wireless data transmission technologies.

The MD500S is small in size and light in weight and is characterized by internal GPS system and video processing system. With the metal outer case, it dissipates heat more effectively and its rugged sturdy housing make it shockproof. This unit is specially designed for mobile video surveillance for different types of vehicles, such as buses, long-distance coaches, taxis, logistics vehicles, special purpose vehicles (such as armored cars), and private cars.

2.2 Product Functions

2.2.1 DVR Function

- 4-channel 720p live video recording
- Automatic video overlaying
- Search and play back videos via the MS03 platform, MS03 app or MTPlayer software
- Download videos via the MS03 platform or MS03 app
- OSD overlay for video recording
- SOS alert video recording
- Alert photo capturing
- Video image quality settings
- Self-adaptive camera resolution and format

2.2.2 ADAS Function

- Forward collision
- Distance detection
- Left lane departure
- Right lane departure

- Front vehicle start

2.2.3 DMS Function

- Turn head to the left
- Turn head to the right
- Raise head
- Lower head
- Drowsiness
- Yawning
- Calling
- Smoking
- Driver absence

2.2.4 Position Tracking

- GNSS + LBS positioning
- Real-time location query
- Tracking by time interval
- Tracking by distance
- Tracking by mobile phone
- Speeding alert
- Cornering report

2.2.5 Alert

- SOS alert
- GPS antenna cut-off alert
- External power supply cut-off alert
- GPS blind spot alert
- Engine or vehicle door status alert
- Geo-fence
- Video signal lost or recovery alert
- Harsh braking alert
- Harsh acceleration alert
- I/O port detection
- Driver fatigue alert

2.2.6 Other Functions

- Support a CAN bus interface
- Support a temperature sensor
- Support a RFID reader
- Support multiple types of fuel level sensors
- Support two-way calling
- Play local videos by using MTPlayer software
- Upload data via 4G or WiFi

- Configure the MDVR by using the local area network (LAN) web page
- Support parallel running of two systems
- Support the WiFi hotspot function
- Preview videos by using the RTMP
- Support MTViewer Ai app

2.3 Product Specifications

Item	Parameter	Specifications
Power supply	Rated voltage	DC: 11–36 V. Rated input: 12 V/2 A
Storage medium	Micro SD card	Up to 1000 GB (It is recommended that you should use a class 10 or above micro SD card.)
System structure	System operation	Android operating system
Audio and video	Video input	Support 1-channel DMS, 1-channel ADAS, and 2-channel 720p audio and video recordings Voltage output: 5 V/0.5 A
	Resolution	Storage stream: D1 (704*576), WD1 (960*576), and 720p (1280*720) Live stream: CIF (352*288) and D1 (704*576)
	Video compression standard	H.264 (Support RTMP and AVMSG video streams)
	Audio input	4-channel camera Mic input. The audio function is required for the camera. 1-channel 3.5 mm headphone jack input
	Audio output	1-channel 3.5 mm headphone jack output
	Audio compression	Support Advanced Audio Coding (AAC) only
	Video search and playback	Search and play back videos based on the channel, recording type, bit rate type, or time.
	Recording method	Simultaneously record general videos and alert videos as well as sounds and videos.
2G/3G/4G	MD500S	LTE FDD: B1/B3/B7/B8/B20/B28 LTE TDD: B38/B40 WCDMA: B1/B8 GSM: 900/1800MHz
	MD500S-E	GSM:850/900/1800/1900MHz WCDMA: B1/B2/B4/B5/B8 LTE FDD: B1/B2/B3/B4/B5/B7/B8/B20/B28 LTE TDD: B38/B39/B40/B41
	MD500S-A	WCDMA: B2/B4/B5 LTE FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B66/B71 LTE TDD: B41
	MD500S-J	WCDMA: B1/B6/B8/B19 LTE FDD: B1/B3/B5/B8/B11/B18/B19/B21/B26/B28 LTE TDD: B41
	MD500S-W	Only the WiFi function is supported, and LTE is not supported.
WiFi	Internal WiFi module. Support WiFi 802.11a/802.11b/802.11g/802.11n/802.11ac. Frequency: 2.4 GHz or 5 GHz. Support AP/STA mode.	

GNSS	1. GPS 2. GPS + BeiDou 3. GPS + GLONASS 4. GPS + GLONASS + BeiDou	
Protocol	Protocol supported	Meitrack protocol (CCE) + RTMP
Power consumption	Static operating current	Average power consumption: 65 mA (The ACC is off, and a piece of positioning data is uploaded every 10 seconds.)
	Operating current	Maximum power consumption: 1100 mA. Average power consumption: 600 mA. (The ACC is on, ADAS and DMS are running, two cameras are connected, and the WiFi hotspot is enabled, and a piece of positioning data is uploaded every 10 seconds.)
	Current in sleep mode	In standby mode, the power consumption is about 15 mA.
Others	Operating temperature	Device without a battery: -20°C to 70°C
	Sensor	Built-in 3-axis accelerometer
	Internal Bluetooth module	BT2.1 + EDR/3.0/4.1 LE/4.2BLE
	Protocol	Support Meitrack CCE protocol
	I/O port	4 input ports 2 output ports 2 analog input ports 1 1-Wire port 1 CAN bus interface 1 RS232 port 4 AV input ports
	Audio interface	3.5 mm audio interface, connected to the speaker or microphone. Used for two-way calling or two-way radio functions.
	Outer case	Dimension: 120 mm x 70 mm x 25 mm
	Weight	300g

2.4 Main Device and Accessories

Standard Accessory	Quantity	Description
MD500S MDVR	1	The 14-pin I/O cable is 20 cm in length.
CD download card	1	
A57 speaker	1	
A58 microphone	1	
Audio cable	1	
GSM antenna	1	Standard 4G antenna (excluding WiFi version devices)
GPS antenna	1	
WiFi antenna	1	Standard WiFi antenna

Optional Accessory	Quantity	Description
A53 fuel level sensor (analog input voltage)	1	
A61 temperature sensor box	1	
A52 digital temperature sensor	1	The cable is three meters, five meters, 10 meters or 20 meters in length. Others need to be customized.
USB cable (standard Android cable)	1	
Relay	1	12 V/24 V
iButton reader	1	Work with the probe.
Camera of the ADAS	1	Camera used for the ADAS
Camera of the DMS	1	Camera used for the DMS
Surveillance camera	1	720p camera (Support audio)
ASUF101&ASUF102 Bluetooth Ultrasonic Fuel Level Sensor	1	RS232

2.5 About the MDVR

2.5.1 Product Appearance

Figure 2.5.1 Front panel

Interface	Sign Name	Description
Microphone/Speaker interface	Audio	Connect to the microphone or speaker.
USB debug port	USB	Connect to a PC to configure device parameters.
Power button	POWER KEY	Turn on or turn off the device.
WiFi	WIFI	WiFi antenna connector
GPS	GPS	GPS antenna connector
3G/4G	3G/4G	SMA connector. 3G/4G main antenna.

2.5.2 LED Indicator

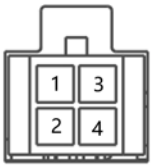
Sign Name	Color	LED Indicator	Indicator Status	Description
3G/4G	Green	3G/4G LED indicator	Steady on	There is an incoming call, or the subscriber you dialed is busy now.
			Blink fast (once every 0.1 seconds)	The device is being initialized.

			Blink fast (0.1 seconds on and 2.9 seconds off)	A signal is received from a base station.
			Blink slowly (1 second on and 2 seconds off)	No signal is received from a base station.
GPS	Blue	GPS LED indicator	Steady on	A button or an input is triggered.
			Blink fast (once every 0.1 seconds)	The device is being initialized, or the battery power is low.
			Blink fast (0.1 seconds on and 2.9 seconds off)	A GPS signal is received.
			Blink slowly (1 second on and 2 seconds off)	No GPS signal is received.
SD	Green	SD card LED indicator	Blink fast (frequency for writing data)	An SD card is detected, and audio and video data is written to the SD card.
			Blink suddenly (once every 5 seconds; indicator on: 0.1 seconds)	An SD card is detected, but no data is written to the SD card.
			Steady off	No SD card is detected.
VLOSS	Red	Video lost LED indicator	Steady on	All AV inputs are not connected to cameras.
			Blink suddenly (once every 5 seconds; indicator on: 0.1 seconds)	One AV input is not connected to a camera.
			Blink suddenly (2 times every 5 seconds; indicator on: 0.1 seconds; interval: 0.3 seconds)	Two AV inputs are not connected to cameras.
			Blink suddenly (3 times every 5 seconds; indicator on: 0.1 seconds; interval: 0.3 seconds)	Three AV inputs are not connected to cameras.
			Steady off	All AV inputs are connected to cameras.
WIFI	Green	WiFi LED indicator	Blink suddenly (once every 5 seconds; indicator on: 0.1 seconds)	There is a WiFi module, but no data is sent.
			Blink fast	WiFi data is sent and received normally.
			Steady off	There is no WiFi module.
			Blink slowly (1 second on and 2 seconds off)	The WiFi hotspot is enabled.

2.5.3 AV Input Port and RS232 Port Definition

Figure 2.5.3 Rear panel

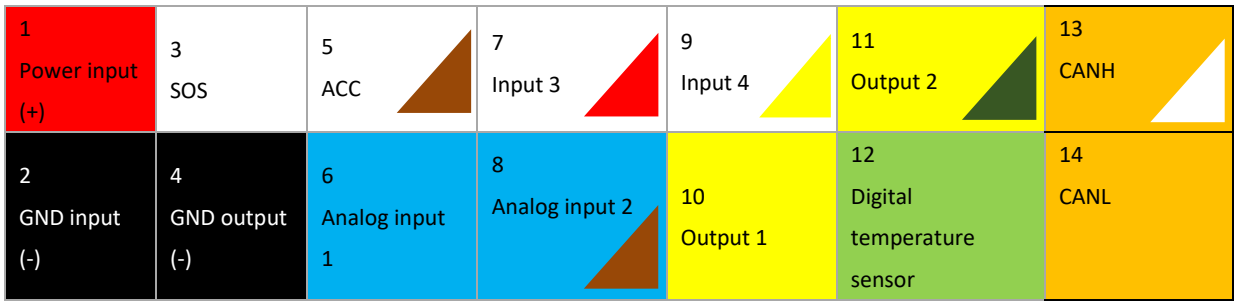
Interface	Sign Name	Description
AV input port	AV-IN1 AV-IN2 AV-IN3 AV-IN4	Four 4-pin ports (5557 interface), connected to cameras (5 V). Four-channel audio and video recordings are supported. By default, the AV-IN1 port is connected to the DMS, and the AV-IN2 port is connected to the ADAS. Frame rate: 1–25 FPS Resolution: 720p/WD1/D1 (optional) After the disk is full, old videos are replaced with new ones or video recordings are stopped. Audio and videos can be recorded simultaneously.
RS232 port	RS232 EXT	4-pin port, connected to a 4-pin accessory, such as the RFID reader. It is reserved for other customized peripherals, such as the magnetic card reader.



RS232

Pin Number	Description (Meitrack Handset)
1	Power output Output voltage: 5 V
2	Ground wire
3	RXD
4	TXD

2.5.4 I/O Port



Pin Number	Cable Color	Description
1 (Power +)	Red	Positive charge of the power input. Connect to the positive charge of the vehicle battery. Input voltage: 11–36 V. 12 V is recommended.
2 (GND)	Black	Ground wire. Connect to the negative charge of the vehicle battery or to the negative terminal.
3 (SOS)	White	Digital input 1. Negative trigger (SOS button by default)
4 (GND output)	Black	Ground wire. Connect to input 1 (SOS button)
5 (ACC)	White & brown	Digital input 2. Positive trigger Connect to the vehicle's ACC cable by default to detect the vehicle's ACC status.
6 (Analog input 1)	Blue	Analog input 1 with 12-bit resolution. Valid voltage: 0–30 V Connect to an external sensor, such as the fuel level sensor.
7 (Input 3)	White & red	Digital input 3. Positive trigger by default. It can be switched to negative trigger. Connect to the turning left signal light cable.
8 (Analog input 2)	Blue & brown	Analog input 2 with 12-bit resolution. Valid voltage: 0–30 V There is a white plug on this analog input cable, and the cable is connected to the A53 fuel level sensor by default.
9 (Input 4)	White & yellow	Digital input 2. Positive trigger by default. It can be switched to negative trigger. Connect to the turning right signal light cable.
10 (Output 1)	Yellow	Output 1. Low level trigger by default (0 V). Invalid: open collector output Maximum voltage for an open collector output (invalid): 40 V. Maximum current: 500 mA. Allow users to configure it as the high level trigger. Connect to an external relay to remotely cut off the vehicle fuel cable or engine power supply.
11 (Output 2)	Yellow & brown	Output 2 Valid: low level (0 V) Invalid: open collector output Maximum voltage for an open collector output (invalid): 40 V. Maximum current: 500 mA. Allow users to configure it as the high level trigger. Connect to an external relay to remotely cut off the vehicle fuel cable or engine power supply.
12 (Digital sensor input/iButton)	Green	TTL3.3V level Connect to the A52 digital temperature sensor by default by using the A61 sensor box. It can also be connected to the iButton reader.

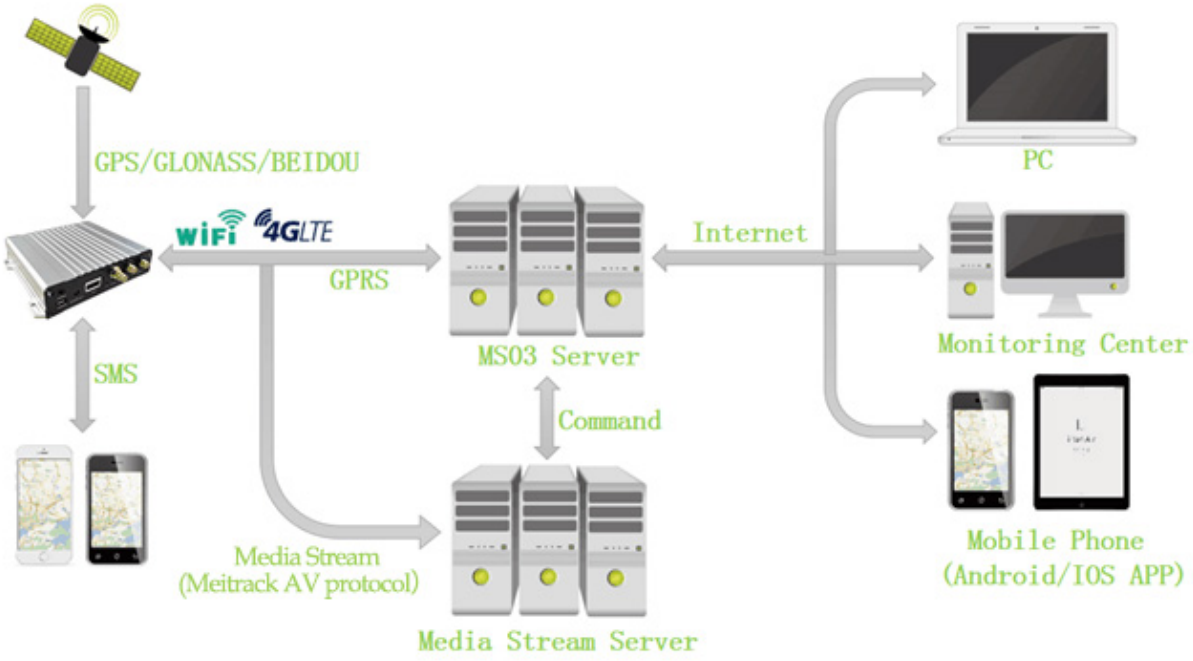
13 (CANH)	Orange & white	Connect to a CAN bus peripheral.
14 (CANL)	Orange	Connect to a CAN bus peripheral.

3 How it Works

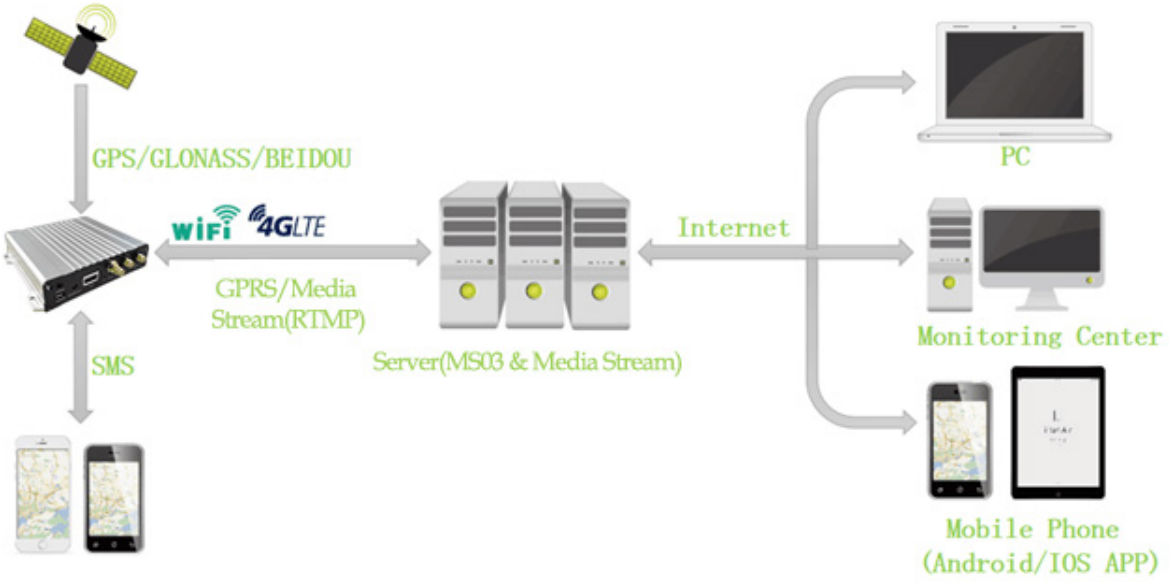
3.1 Working Diagram

The device supports the RTMP (audio and video transmission protocol) and is compatible with Meitrack's private audio and video transmission protocol. There are two communication modes as follows:

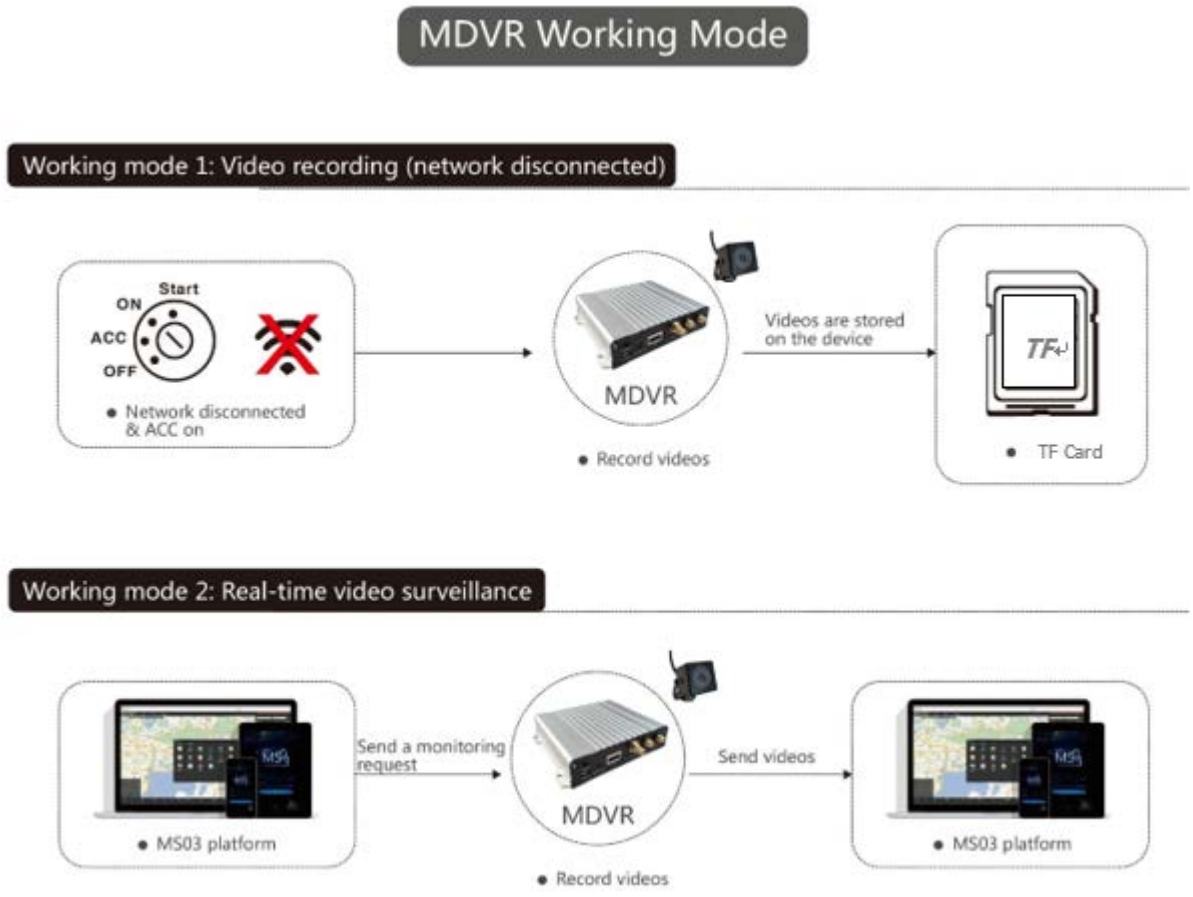
Mode 1: Meitrack GPRS protocol (CCE) + Meitrack's private audio and video transmission protocol

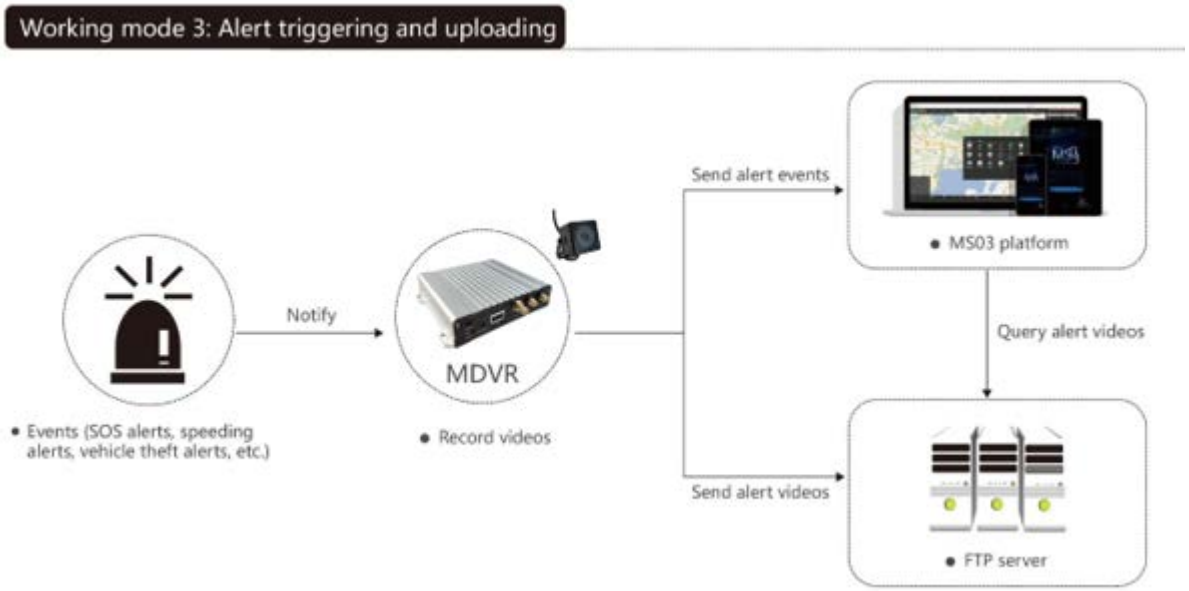


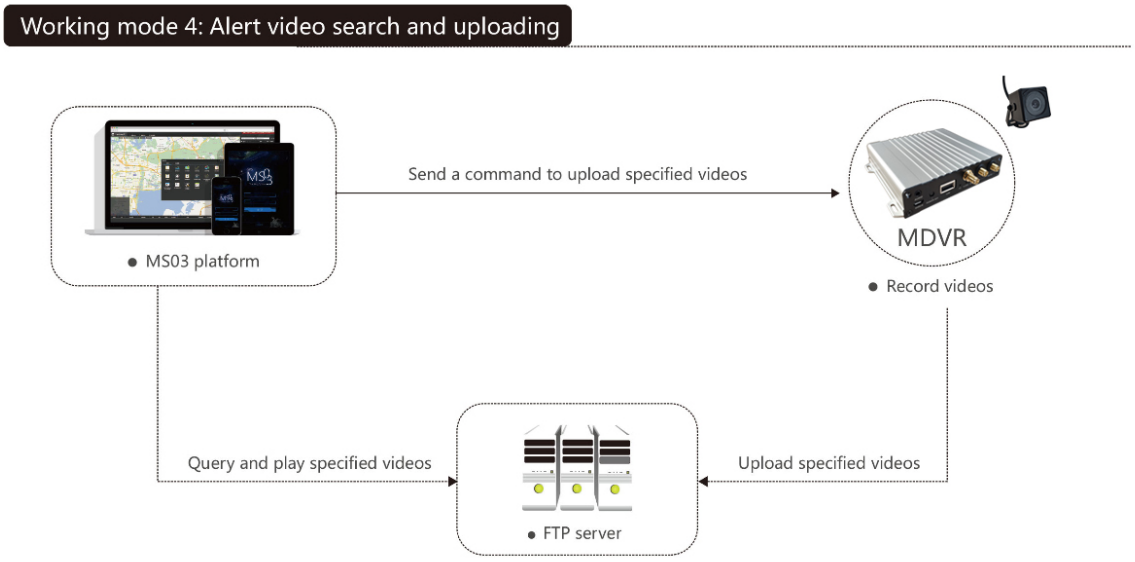
Mode 2: Meitrack GPRS protocol (CCE) + RTMP



3.2 Working Mode







4 Device Installation and Test

This chapter is intended for customers who use the MD500S MDVR for the first time, helping them configure and operate the device, understand the basic functions of the device, and test the device alerts.

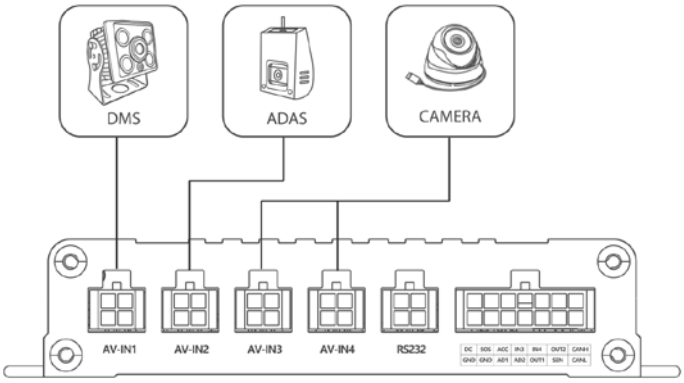
For more information about fast installing and using the MDVR, see the following sections.

4.1 Installing a SIM Card and Micro SD Card

Loosen the screws by using a screwdriver, remove the upper cover, insert the SIM card into the SIM card slot, and install the micro SD card.

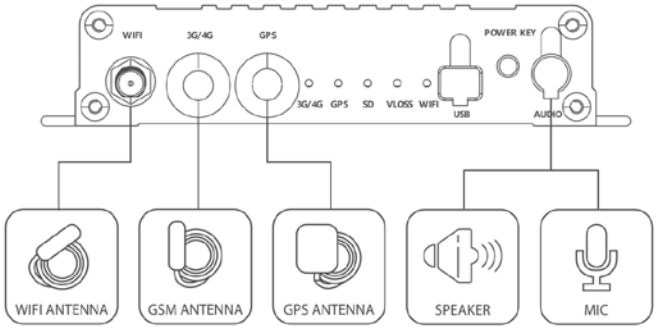
4.2 Installing Cameras

Connect the AV-IN1 port of the device to the camera of the DMS, AV-IN2 port of the device to the camera of the ADAS, AV-IN3 and AV-IN4 ports of the device to AHD cameras as required.

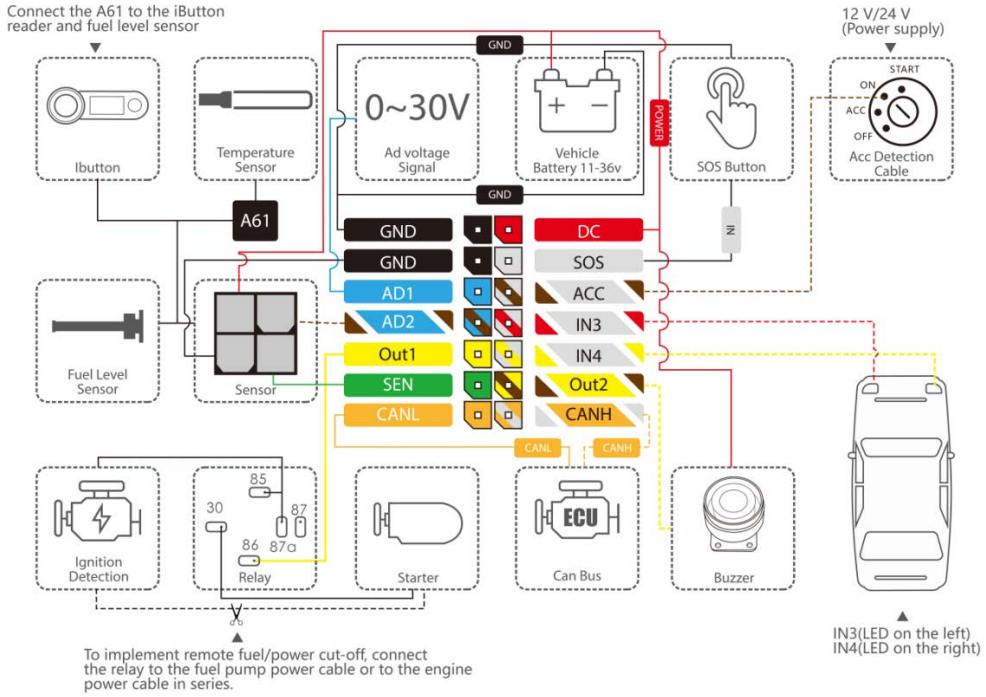


4.3 Installing the I/O Cable, Antennas, Speaker, and Microphone

1. Install the WiFi antenna, GSM antenna, GPS antenna, speaker, and microphone based on the following wiring diagram.



2. Connect to the I/O port based on the following wiring diagram.



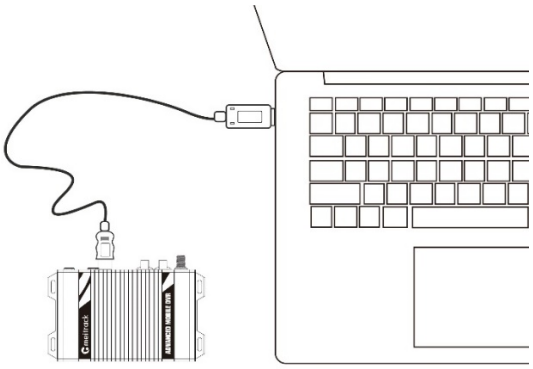
Note:

a. The power cable, ground wire, and ACC cable must be connected. When the device detects that the ACC is on, the video system starts operating.

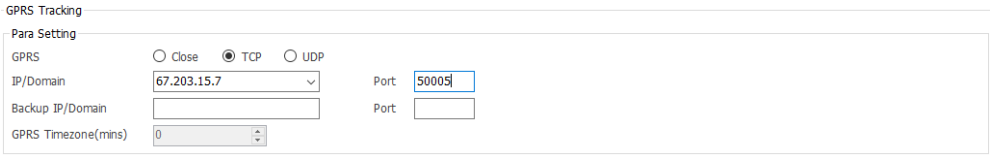
b. Input 3 and input 4 are connected to the turning left and right signal light cables respectively. If not, when the vehicle turns to the left or right, a lane departure alert is generated.

c. The speaker is connected to implement voice broadcasting of the ADAS and DMS, two-way calling, and two-way radio.

4.4 Setting the IP Address and Port By Using Meitrack Manager



If Meitack MDVR platform is used, the IP address is set to **67.203.15.7** and port set to **50005**.

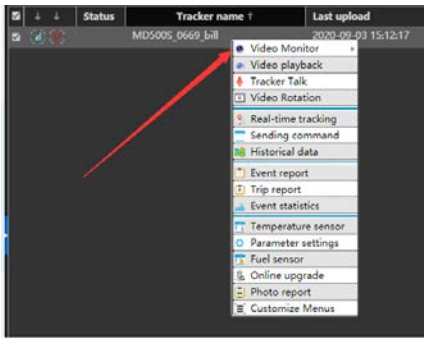


You are not advised to modify the default values of other parameters. For more information about how to configure the IP address and port by using Meitrack Manager, see the *Meitrack Manager User Guide*.

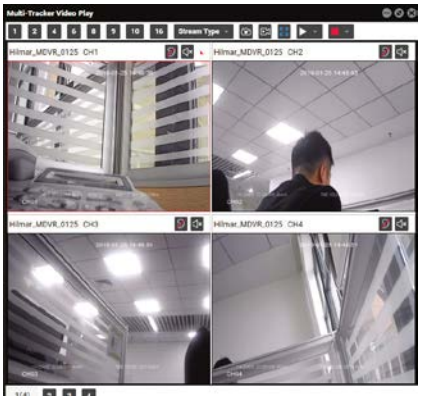
4.5 Platform Function Test

Before testing related DMS and ADAS functions, make sure that the device is online, video preview and two-way calling functions are available, and the device is installed into the vehicle.

Visit the MS03 platform, right-click a device, and select **Video Monitor**.



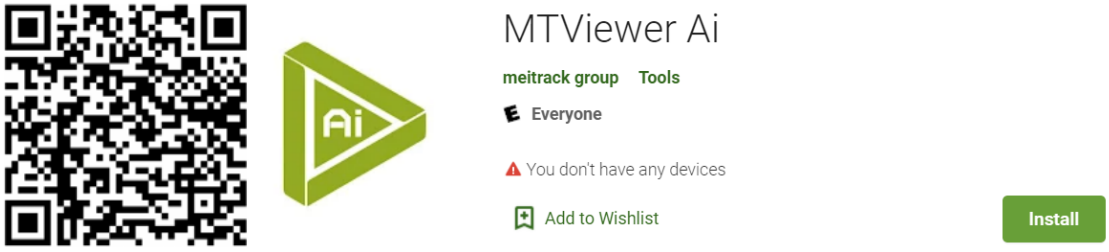
If images are displayed as follows, it means that the cameras work properly.



Note: After you purchase devices, please apply to Meitrack sales team for a platform testing account.

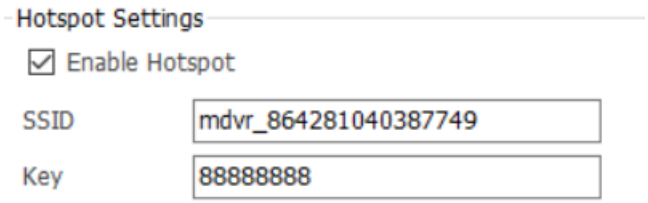
4.6 Downloading and Using MTViewer Ai App (Android Only)

Visit https://play.google.com/store/apps/details?id=com.meitrack.adas_dms_controller, and download MTViewer Ai app.



Enable the device WiFi hotspot.

Start Meitrack Manager, enter the SSID and key of the WiFi hotspot, and click **Set**.



Connect your mobile phone to the device's WiFi hotspot.

On the WiFi settings page of your mobile phone, connect the mobile phone to the device's WiFi hotspot.

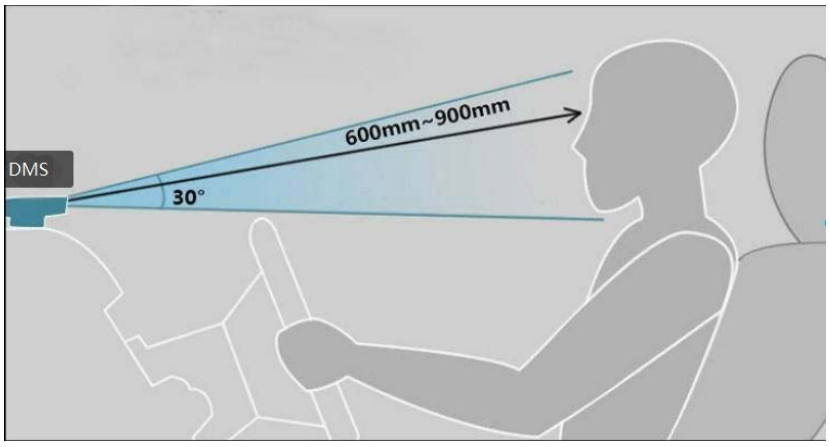
Note:

1、ACC needs to be activated when APP connects to MD500S.

2、When app is connected to MD500S WIF, the device will drop the line.

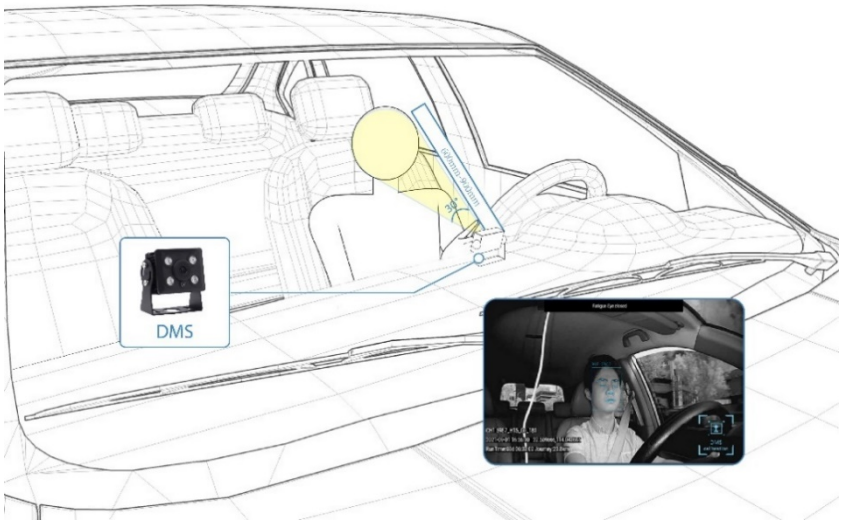
4.7 Installing the Camera of the DMS

The steering wheel of trucks and buses is low, so you should install the DMS on a higher location around the dashboard. It should not be higher than the driver's eyes, and the angle between the installation location and the driver's face should not be higher than 30 degrees. Please ensure that the distance between the lens and eyes ranges from 60 cm to 90 cm. It is recommended that the angle between the installation location and the driver's face should not be higher than 30 degrees.



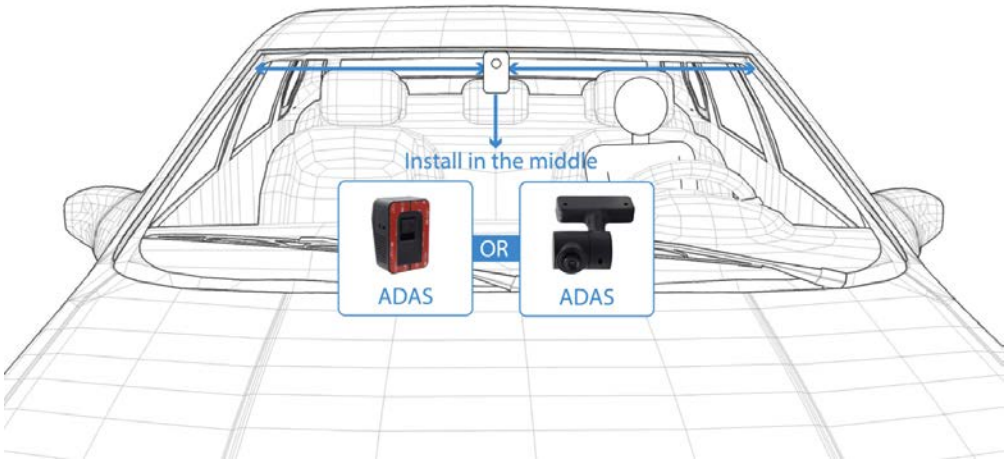
If the DMS is installed into a car, you have to install it on the left or right position of the steering wheel. Because the steering wheel

of the car is high. The angle between the installation location and the driver's face should not be higher than 30 degrees. Facial features of the driver can be captured. The camera installation location can be adjusted by using MTViewer Ai app.



4.8 Installing the Camera of the ADAS

Please ensure that the installed ADAS does not blur the driver's vision. It is recommended that you install the ADAS in the middle of the distance between the uppermost sides of two windshields. The installation location is shown in the following figure:

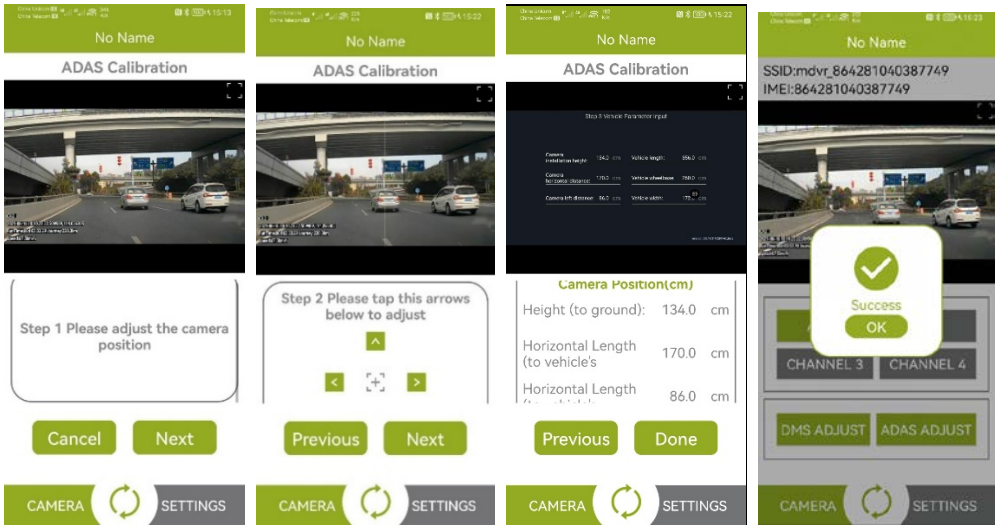


Note: After the ADAS installation is finished, adjust the camera location by using MTViewer Ai app to improve the accuracy of the ADAS.

Step 1: Adjust the installation location of the camera of the ADAS.

Step 2: Adjust the yellow horizontal line to the horizon and yellow vertical line to the middle of the road, as shown in the following figure.

Step 3: Set calibration parameters of the ADAS.



4.9 ADAS and DMS Voice Broadcasting List

Audible alerts about the ADAS and DMS are as follows:

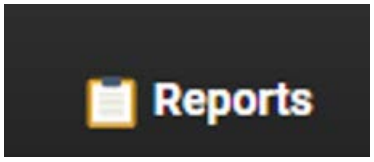
Camera	Alert Type	Audible Alert
DMS	Turn head to the left	Please face forward
	Turn head to the right	Please face forward
	Raise head	Please face forward
	Lower head	Please face forward
	Drowsiness	Attention, drowsiness detected
	Yawning	Please awake
	Calling	Please do not use mobile phone
	Smoking	No smoking

	Driver absence	Please return driver seat
ADAS	Forward collision	Watch out the front vehicle
	Distance detection	Please keep vehicle distance
	Left lane departure	Watch out lane departure
	Right lane departure	Watch out lane departure
	Front vehicle start	Watch out the front vehicle starts

4.10 Viewing Alert Photos on the MS03 Platform

Log in to the MS03 platform, and check whether ADAS and DMS alert photos are uploaded to the platform successfully. If pictures are complete and are not lost, the device communication function is normal and tests are passed.

1) On the main interface, choose **Reports**.

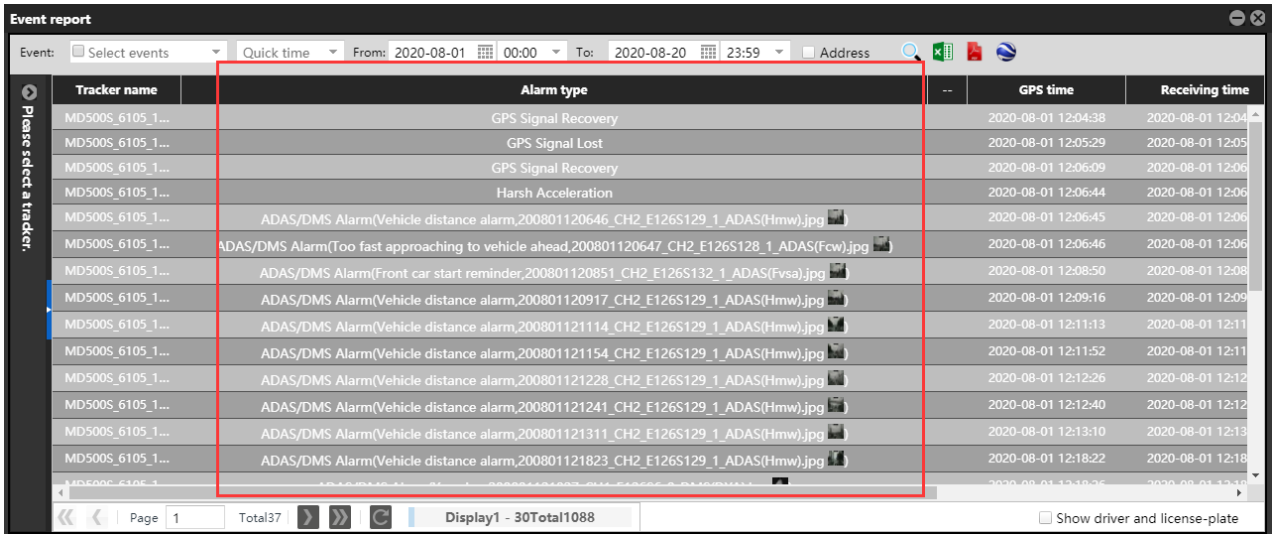


2) On the **Reports** window that is displayed, select **Event report** from **Use Normal**.

3) On the **Event report** window that is displayed, click the menu arrow on the left. Then the tracker list is displayed.

4) Select a tracker to be queried, set the query time, and click the search icon.

5) Related reports are displayed, as shown in the following figure.



6) Double-click an event. Then a picture captured is displayed.

If you have any questions, do not hesitate to email us at info@meitrack.com.