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DRIVER MONITORING SYSTEM (DMS)

Installation and Programming Manual

SHC-20280C/I

Driver Monitoring System
Installation and Programming Manual

Disclaimer

Stortech Electronics does its best to ensure the integrity and accuracy of the contents in this document and cannot guarantee this. The outcome of using this document shall be entirely the user's own responsibility. Stortech Electronics reserves the right to change the contents of this document without prior notice.

- Design and specifications are subject to change without prior notice.
- It is the responsibility of the user to ensure the products are services and maintained by a trained engineer.

Important Safety Instructions

1. Read, keep, and follow these instructions.
2. Only use the power supplies that are recommended in the manual, failure to do so could cause damage to the product.
3. Before cleaning, remove all cable connections from the control box.
4. When cleaning the product's surface, use a soft, dry cloth or a damp cloth. Do not use detergent or products that contain alcohol, solvents or surfactants or oil constituents. They may damage the product. Especially the viewing bubble/window)
5. Do not use excessive force when installing the product, the camera may be damaged and fail to work. If the warranty seal is damaged, the warrantee will become void.
6. Install or uninstall the product as described in the manual, failure to do so may damage the product, affect the functions and performance that could invalidate the warrantee.
7. Install the product by referring to "Installation & connection" in the user manual.
8. This product is designed to be installed by trained professionals, incorrect installation may cause the product not to perform as expected or to malfunction.
9. Storage temperature: -40 ~ +85℃; The Operating temperature of equipment with LTE module is: -20 ~ +60℃, and that of equipment without LTE module is: -20 ~ +70℃,Relative humidity: RH90%;
10. The device isn't waterproof and please do not place this device in bathroom, kitchens, swimming pools or similar places.

Contents

Overview

Basic Features

- 2MP resolution CMOS Sensor
- 2.8mm lens
- True Day/Night with ICR
- 6 x 940nm LED 3m illumination
- Below 0.3W EN62471 certified
- 120dB Wide Dynamic Range
- Facial recognition & behavioural detection
- No External Controller Needed
- Web page Calibration via Wi-Fi Hotspot
- Indoor only

Features

- Fatigue Driving Detection
- Distraction Driving Detection (Line of Sight Deviation from Driving Direction)
- Abnormal Driving Behaviour Detection (Making Phone Call/Smoking)
- The detection function can still work normally even when the driver is wearing the mask
- Driver Identity Recognition by Face Recognition Technology, Based on WFLW database, achieve high precision of face with 98.75% rate
- Support detecting the head posture in a wide range of ±90º
- Integration with DVR, Uploading Alarms and Recording Videos
- Built-in Recording Function, Supporting one 128GB Micro SD Card
- Built-in Wi-Fi and GPS

Packaging List

- Driver Fatigue Monitoring System x 1
- External power supply cable (4-Pin aviation). 1
  - Note the 4G version has bare wires

	Caution	
⚡	Risk of electric shock Do not open	⚠
	Caution: to reduce the risk of electric shock, Do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.	

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

This symbol is intended to alert the user not to dispose of electrical and electronic equipment.

Do Not: Place this device in a humid, dusty or smoky environment. Drop or hit the device.
The operating voltage of device is 10-32V, able to be used for 12V and 24V systems, exceeding the limit operating voltage may damage the device; Too high a voltage can damage the device.
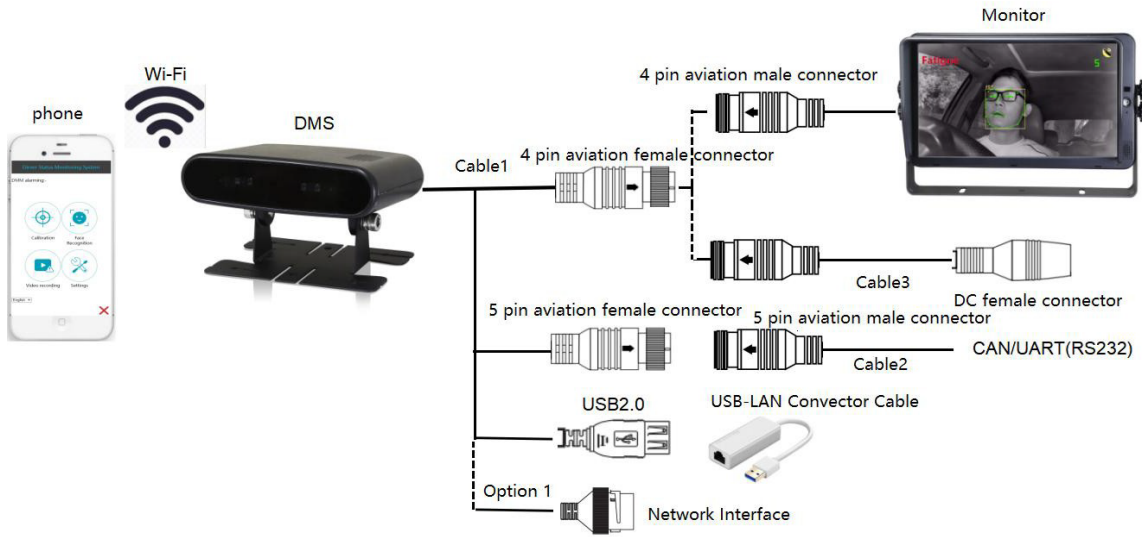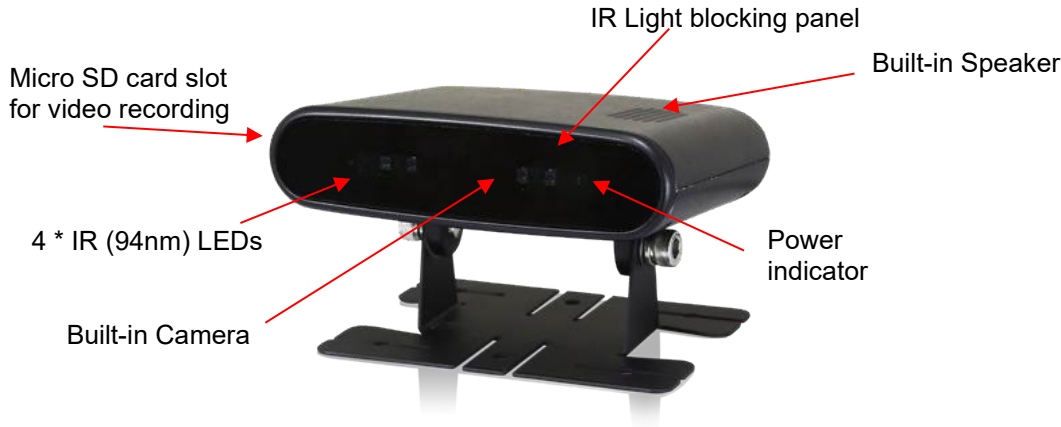
CAUTION
You are cautioned that any changes or modifications not expressly approved in this manual could void your warrant and necessitate expensive repairs.

Installation

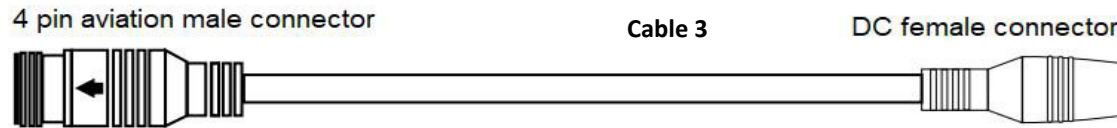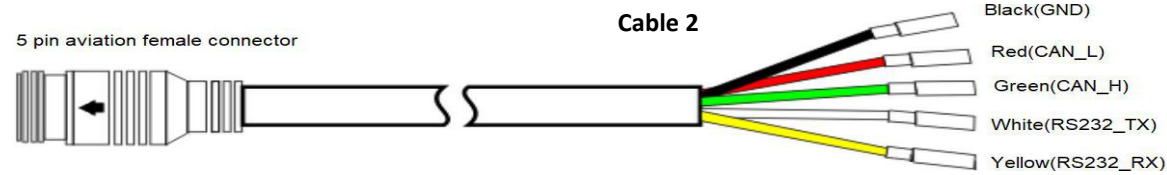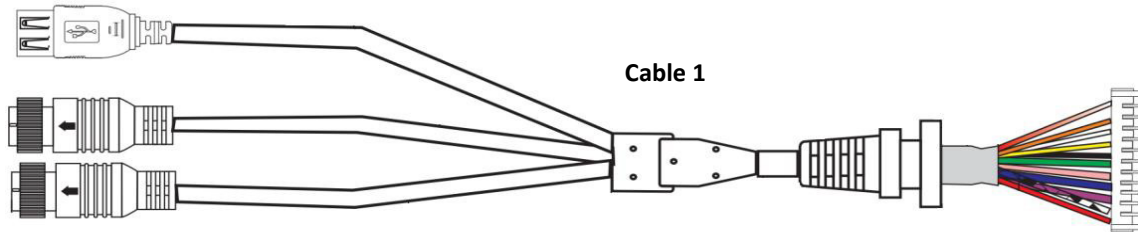## DEVICE COMPONENT AND SYSTEM CONNECTION

DMS Key Components Description

Micro SD card slot for video recording

IR Light blocking panel

Built-in Speaker

4 * IR (94nm) LEDs

Power indicator

Built-in Camera

1. The Wi-Fi hotspot of the device currently supports AP & STA modes.
   - AP mode: the Wi-Fi is turned on via the device. To enable connection with the user's mobile phone of computer.
   - STA mode: The device can actively connect to the Wi-Fi hotspot of "STA SSID" data item in "Network Configuration."
2. While a Monitor is optional, it is a simple method of setting up the device.
   - The monitor can also power the device.
3. The device outlet of cable 1 is optional with two options.
   - 4-PIN aviation female connector + 5-PIN aviation female connector + USB2.0
   - 4-PIN aviation female connector + 5-PIN aviation female connector + Network interface.
4. USB-LAN connector cable is an optional accessory.

Overview

Cable Connection definitions

Cable 1

5 pin aviation female connector

Cable 2

Black(GND)
Red(CAN_L)
Green(CAN_H)
White(RS232_TX)
Yellow(RS232_RX)

4 pin aviation male connector   **Cable 3**   DC female connector

- o The left end of **cable 1** connects to connecting terminal inside the DMS, the right end 4-PIN aviation female connector connects the monitor or external power cable (**cable 3**).
- o 5-PIN aviation female connector connects **cable 2,** for leading to RS232 and CAN communication cable.

DMS INSTALLATION AND CALIBRATION

The DMS needs to be installed on the dashboard away from the driver, between 0.8 ˜ 1.2m away and at an angle of about ± 30°. See Right.

Once a suitable installation position has been located. Carry out the installation and calibration at the same time with the installer and driver.

Wi-Fi Connection

Power up the DMS device before trying to calibrate and setting the parameters with the mobile phone. Follow the below steps.

1   Us the mobile phone to locate the device's Wi-Fi SSID, named "DMS-XXXXX". The Wi-Fi SSID will also be displayed on the bottom left of the monitor for 10-sec post powerup.

   The initial Wi-Fi password "88888888".

2   When connecting for the time, there may be a "pop-up" box on the mobile phone. You must click "Connect". To enable the connection between the two,
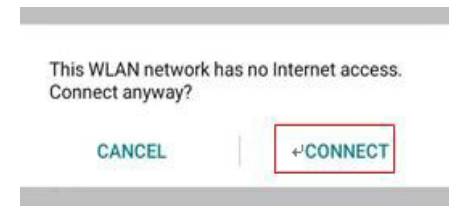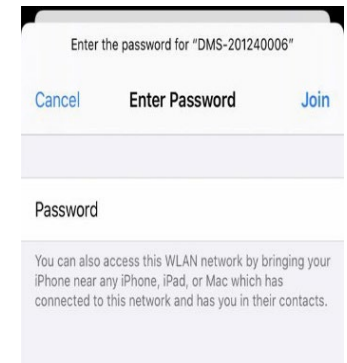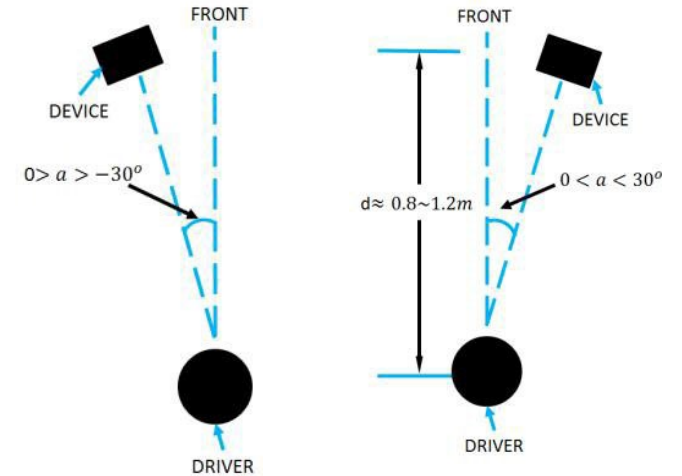
Enter the URL http://192.168.60.1 on the mobile phone's browser (or scan the QR code "Right. The browser will go to the log-in page "Right". Press "login" to enter preview page and view the displayed video in real-time.

The maximum operating distance between the device and mobile phone is about 7m.

After a successful connection, calibration and setup can begin.

P/W blank by default
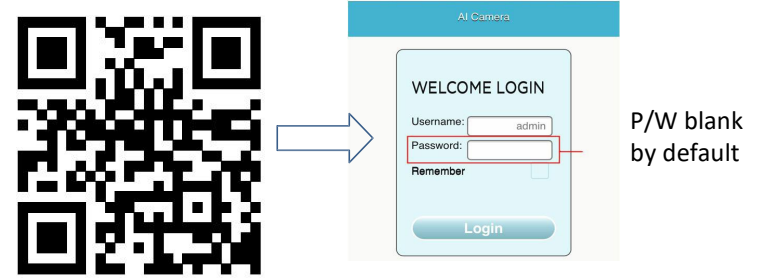
Installation and Calibration Operation Procedures

1. Ensure that the driver is seated in their normal driving position. The Engineer can then click the "Calibration" button ⊕ on the webpage. See "Right".

Three coloured square boxes may appear on the mobile's display.

a) Green: Indicating that the relevant distance and angle between the device and driver are appropriate.

b) Yellow: Indicating that the pitch angle and relative distance is appropriate. But the angle between the device and driver's sight is above the ±30°. The Engineer needs to rotate the device slightly until the box turns Green.

c) Red: Indicating that the relative distance and angle between the device and driver is not appropriate.
   a. The driver's face does not fill the box.
   b. The Engineer need to adjust the devices distance and angle to ensure that the face is completely within the box and relative angle within the ±30°.
   c. The horizontal angle of the device can be adjusted using the Hex nuts seen "Right".

Hex Nut
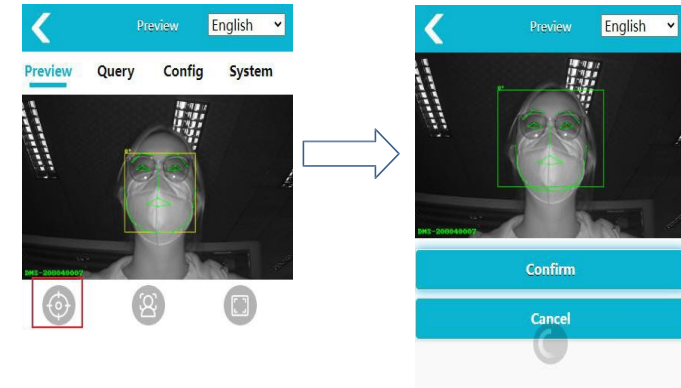
2. Once the square box is green, the Engineer clicks the "Ok" button on the mobile. Start to calibrate as per the voice prompts. These may last 10-sec. During the calibration process, the driver must maintain their normal driving position and loo straight ahead.

   a. A voice prompt will indicate the start of calibration.

   b. Once calibration has been successful, there will be a voice and pop-up prompt. The webpage will then automatically exit the calibration mode.

   c. A failed calibration will be indicated by a pop-up prompt. The webpage will then automatically exit the calibration mode. Re-enter the calibration mode, after slightly adjusting the angle of the device.

   d. Once calibration is complete. The Engineer to mark the device's current position with a pencil. The remove the 3M glue from the devices base and fix the device on the marked position.

Driver Monitoring Mode (DMM) & Face Recognition System (FRS)

Every time the device boots or re-boots, the system will enter the FRM mode, the entering and maintaining driver monitoring modes. To ensure "Normal" operations, Installation and Calibration must be carried out as per the previous chapter.
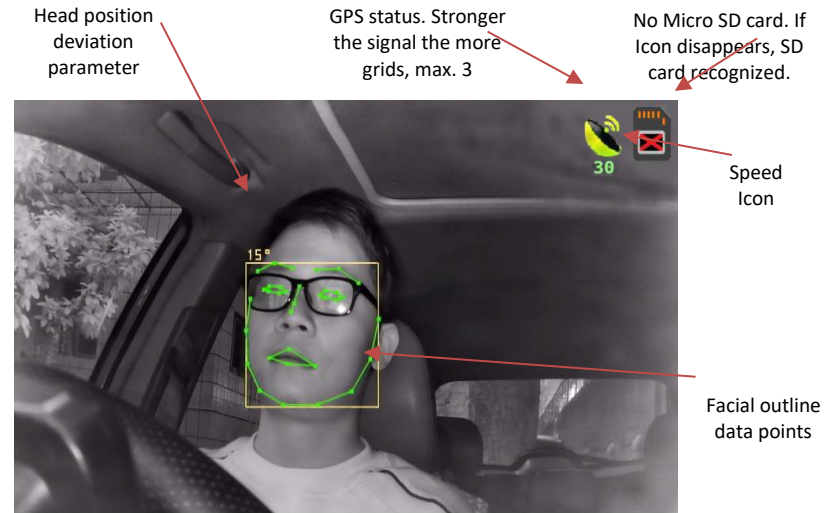
1. DMM includes 11 sub-functions, including: Fatigue Driving Alarm, Distracted Driving Alarm, Phone Call Alarm, No Seatbelt Alarm and Sunglasses Alarm (Even when the driver wears the facemask).

   DMM will only work when the driving speed is greater or equal to that set in the device. See Chapter 8.3

   There are three steps to an alarm trigger
   - Send a sound alarm to notify the driver.
   - Create a video recording ≥ 20 Sec.
   - Send alarm data via RS232 & CAN interface

   During normal operations there are various image overlays. See Right.

Head position deviation parameter

GPS status. Stronger the signal the more grids, max. 3

No Micro SD card. If Icon disappears, SD card recognized.

Speed Icon

Facial outline data points

Fatigue Driving Alarm

This alarm is based upon how open the driver's eyes are. If the eyes close for > 3-Sec a fatigue detection alarm will be triggered. The threshold can be set in the webpage. Note. A "no Facemask Alarm" is off by default.
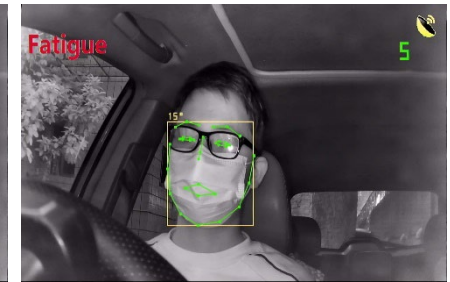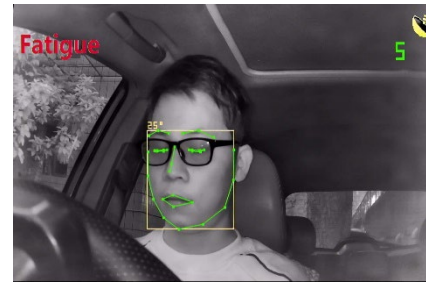
Distraction Driving Alarm

A Distraction Driving Alarm will be triggered if the driver's head deviates left or right > 35 for ≥ 5-Sec.
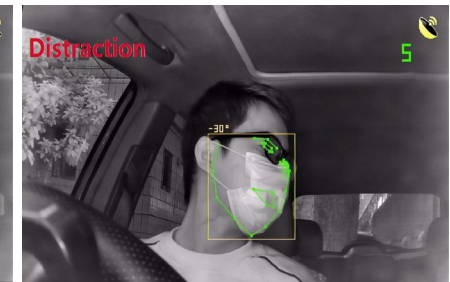
Mobile Phone Usage Alarm

If the driver is detected holding a mobile phone for > 3-Sec a Phone Call Alarm is triggered.
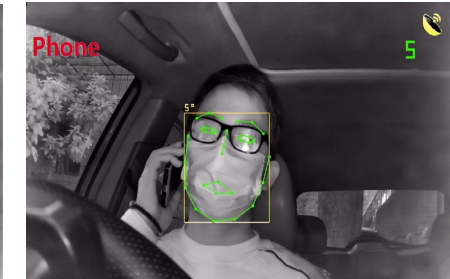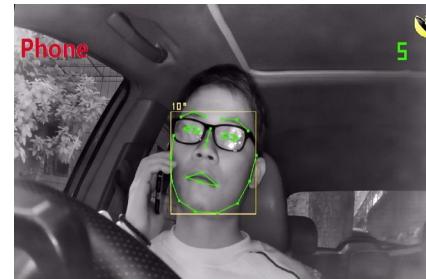
Sunglasses Alarm

If the driver is detected wearing sunglasses for > 2-4 Sec the Sunglasses Alarm is triggered.

No Seatbelt Alarm

If the system detects that the driver is not wearing their seatbelt for > 10-Sec the No Seatbelt Alarm will be triggered.

Smoking Alarm

If the system detects that the driver is Smoking for > 2-Sec the Smoking Alarm will be triggered.

Yawn Alarm

The device triggers a Yawn Alarm is the system detects a driver yawning for > 2- 4 Sec.

No Driver Alarm

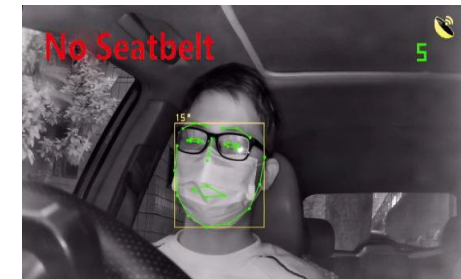If the system detects that there is no driver in the driving seat for > 15-Sec the No Driver Alarm will be triggered.

Note: The alarm will stop after 5 continuous No Driver Alarms or until a driver's is detected. There will be no alarm sound, but the monitor will display an alert as well as a alarm record and CAN data output.

No Facemask Alarm

If the driver has been detected not wearing a facemask for > 2-4 Sec, the No Facemask Alarm will trigger.
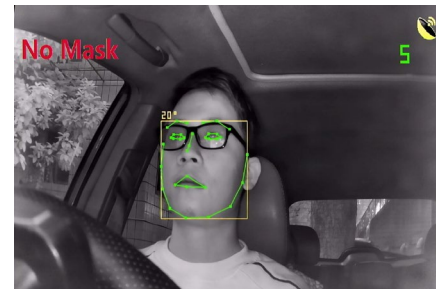
Drinking Water Alarm
If the driver has been detected drinking from a bottle (Water) for > 3-Sec, the Drinking Water Alarm will be triggered.

Lens Coverage Alarm
If the camera's lens is covered for > 20-Sec the Lens Coverage Alarm will be triggered.
Note: There is no video recording but a sound and monitor display alarm and CAN data. The alarm stops after 5 continuous Lens Coverage Alarms.

Face Recognition System (FRS)

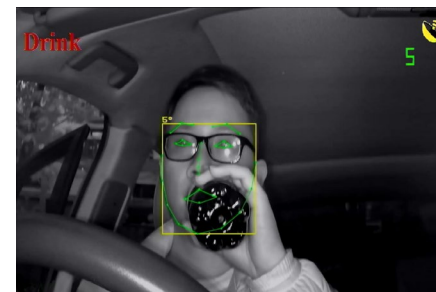The function of FRS is to detect whether the current driver is registered in the device (whether the driver is eligible to drive the vehicle), and then give an audible response. If an unregistered driver is detected, the detection cannot pass, and will make a 20-second video recording and send alarm data through RS232 and CAN interface. Therefore, to achieve FRS, input drivers' face information into the device.

1. **Input a new driver's face information**

   a. Click 👤 button on the web page, to enter the FR interface. Please refer to Section 8.3 for turning On/Off FRS. The change will only be recognised on a device reboot.

   b. Click "New User" button to register the face information of a new driver. After entering the driver's name, a voice will guide you through the process, while the interface will display the progress.

      i. To improve accuracy, it is recommended that the driver shakes their head slightly during input.

2. **Manage Driver's face information**

   a. **Edit** – If a driver's face information needs to be edited, select the edit button corresponding to the driver needing edited. An Edit box will pop up.
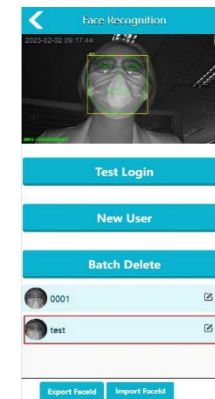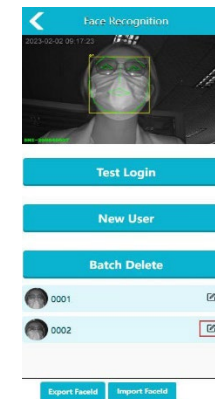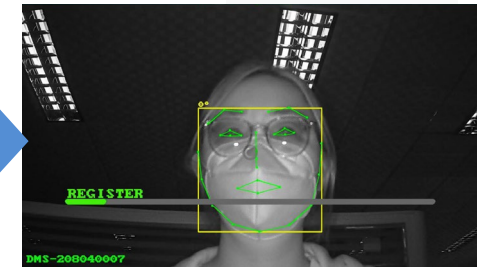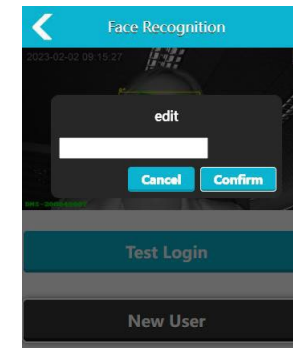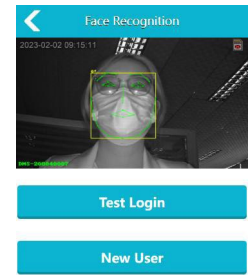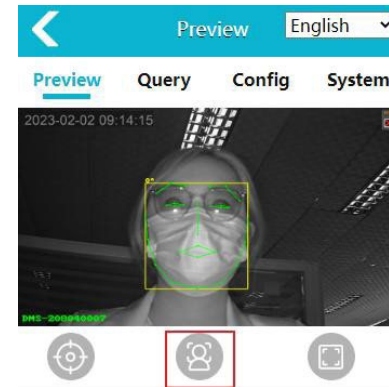
b. **Delete** – To delete a single driver, click the "Delete" button corresponding to the relevant driver. The driver's face data will be deleted.
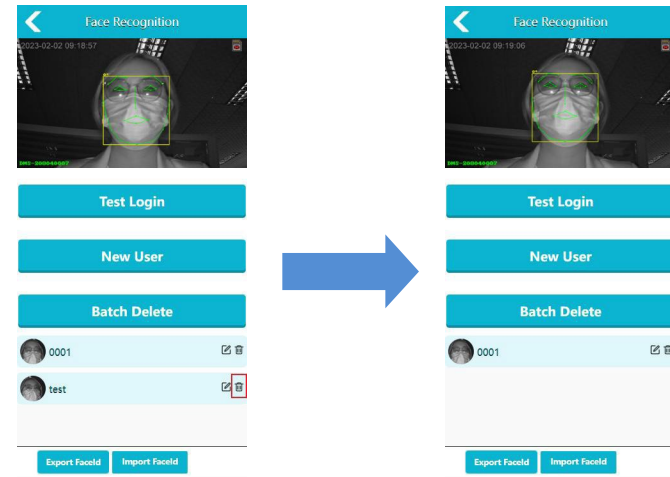
To delete multiple drivers, click the "Batch Delete" button, click each driver to be deleted. Then click the "Batch Delete" button again. The driver's face data will be deleted.

c. Export/Import – To export or import user facial recognition information, click the Export/Import buttons at the bottom o f the webpage.
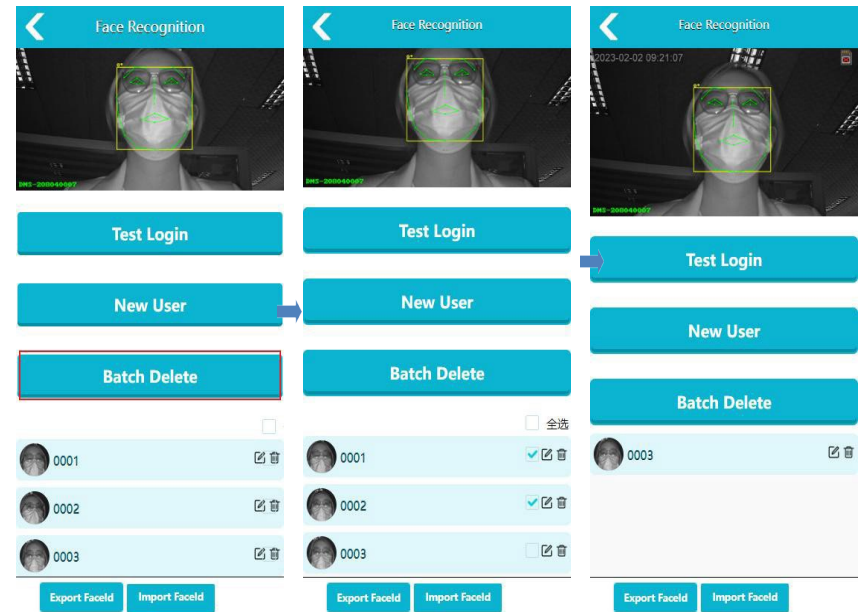
3. **Driver Face Recognition**

Facial Recognition can be run in two-ways.

1. In Function Test mode. Click "login test" button see "Right".

2. In Normal Operation mode. After the device reboots, the FRM will automatically rune (Ensure that FRM is turned on). Facial Recognition is the same as Registering a Face. Except that in the recognition process there is a process bar and the recognition results is indicated by   a   voice.

3. When the device identifies a non-registered face, it will record video for 20-sec and save to micro SD card. Please refer to Webpage Function Setting 3 for replaying the SD Card.

Note: It may take 10-Sec from power up to the device entering FRM mode. The driver is to ensure that they maintain a normal driving position and listen to the voice commands.
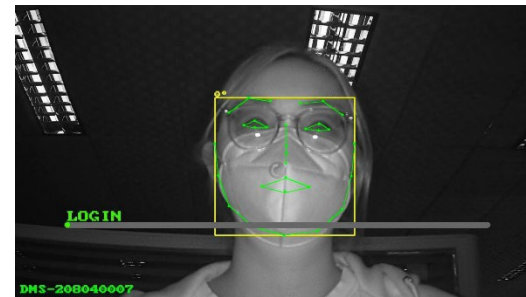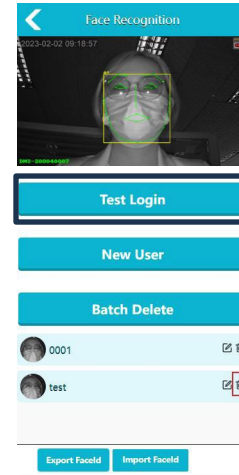
8. Webpage Function Setting

1. Main Interface on the Webpage

Micro SD Card information & video query

Switch Language

Parameter configuration

Real-time display preview

Refer to Chapter 7.2 for FRM

Refer to Chapter 6 for Calibration

2. Query Function

a. **Status Query –** Click the "Query Function" button on the main interface to access. This can be done via Ethernet, Wi-Fi, 4G, CMS server status and storage management information of the device.

b. **Record Query** – "FAT32" is the supported file format for the MicroSD-Card (Named "SD" hereafter). If the SD card is not using FAT32 it will need to be re-formatted. Click the "query" button to enter the interface and check the SD Card status.

   i. If the SD Card icon is displayed in the monitor's top right corner. The system either does not recognise the SD card mounted, an incorrect file system or it is not present.

   ii. Select "SD Card" in "Selecting Device" and the click "Format SD Card" button. After clicking "Ok" and formatting is complete the icon will disappear.

   iii. If the icon is not displayed the SD Card has been mounted correctly. When the SD Card is mounted successfully, click "Record Query" to view the video list.

     I. By clicking "Normal" & "Video" the list of video recorded under normal circumstances is displayed.

     II. By clicking "Warning" & "Video" the list of video recorded due to a "Trigger" is displayed.
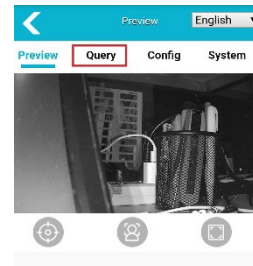
Note: If "Normal" & "Picture" is clicked, a pop-up displaying "Normal Picture Query Is Not Supported" will appear.

Video files are named after a combination of alarm-time and alarm type. Each video file can be downloaded locally, viewed on-line or replayed on a computer with an SD Card slot.

- **Alarm Record:** The device will record 10-sec pre & post event video images of the triggered event.
- **Normal Record:** The device will record both continuous and time-lapse video.
  - If **"ON_CON"** is selected, a Triggered event will not interrupt the normal recording. It will continue recording as per the "Limited Rec Filelen(min)" selected.
  - If **"ON_DIS"** is selected, a Triggered event will interrupt the normal recording. After the Triggered event is over. Normal recording will resume.

Alarm and normal record modes are set-up on the webpage see chapter 8.3. A single page will contain up to 20 video files. Users can click "Previous/next" to switch viewing pages, or input a page number and click "JUMP".

3. Parameter Configuration

Click the "Configuration" button on the main interface to enter the configuration menu to display the following:

Media Configuration, Algorithm Configuration, Network Configuration and System Configuration. To save "Confirm" on each relevant tab must be clicked.
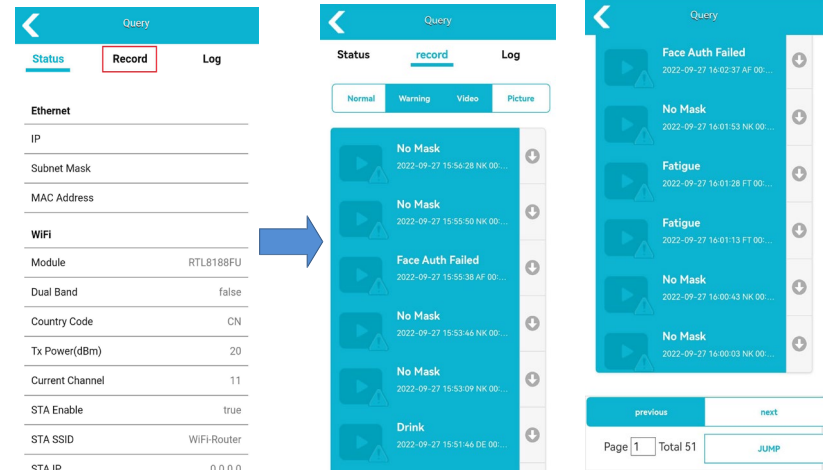
NM	Normal Record	FT	Fatigue Alarm Record
DS	Distracted Alarm Record	CA	Phone Call Alarm Record
SG	Sunglasses Alarm Record	NB	No Seatbelt Alarm Record
SM	Smoking Alarm Record	YW	Yawn Alarm Record
ND	No Driver Alarm Record	NK	No Facemask Alarm Record
AT	Login Timeout Alarm Record	AF	Login Failure Alarm Record
DE	Drinking water Alarm Record		

a. Media Configuration -

Image Mirror	Switch controls whether to turn on mirror image, the default is on.
Image Flip	Switch controls whether to turn on image flipping
Mainstream/SubStream /Picture stream/Display stream	Able to set the parameters of Mainstream/SubStream/Picture stream/Monitor display.
OSD	Switch controls whether to turn on picture stream overlay and to display the time and channel.
Time Format	Set the display format of time.

b. Algorithm   Configuration

Volume	To set the alarm sound.
Audio type	Different audio types can be selected; WITH VOICE being default. When a non-VOICE audio type is selected, the instruction for facial recognition and system calibration will still be VOICE.
DMS Login Mode	Set FR login function, is closed by default. When AUTO is selected, the system will automatically log in when the device is started. When no driver alarm is triggered and the driver appears again, a face recognition login will re-trigger. When BOOT is selected, FR login will be triggered only when the device is started.
Work Speed	Setting the starting speed of the DMM function. E.g. if set to 5km/h, DMS will start when the speed is ≥ 5km/h. The actual speed in driving derives from the built-in GPS module signal or GPS signal from DVR. When there is no signal (such as in an underground passage), "Keep alarming with no-GPS" is on and defaults alarm; "Keep alarming with no-GPS" is off and defaults no alarm. When GPS signal is valid, the algorithm alarm has nothing to do with the on/off of "Keep alarming with no-GPS", but only with the starting speed of the alarm.
Alarming Settings	Set the on/off and alarm interval of DMM, to avoid frequently distracting the driver. OFF indicates that the alarm is off. For example: Distraction Interval is set to 30-Sec. After a distraction alarm, the alarm will only detected again after 30-Sec.
Algorithm Advanced Settings	Set the threshold and time limit of driver's abnormal behaviour monitoring. The function works when sensitivity is set to low. E.g. When Left Distraction Angle is set to 35°, exceeding this will trigger an alarm; when the distraction time limit is set to 5-Sec, it will generate a corresponding alarm prompt after 5-Sec.
Detection Sensitivity	Set the sensitivity of DMS.

c. Network Configuration

Sever Config	Configured switch can be either normally open/close server login function.
IDS server	Configuring server IP address and port number (183.233.190.23:9090, set this parameter based on your actual situations) can connect to the corresponding server's CMS to view the real-time stream and device information.
Server Network Type	Select the connection mode to the server. LAN, Wi-Fi, and 4G are optional.
Upload Files Options	Set options for uploading files, including OFF, VIDEO and PICTURE. The default is VIDEO. When "Upload Files Options" is selected as OFF, the device files will not be uploaded to the CMS server; When "Upload Files Options" is selected as VIDEO, only the alarm video of the device will be uploaded to the CMS server; When "Upload Files Options" is selected as PICTURE, only the alarm picture of the device is uploaded to the CMS server. (If the device is not online on the CMS server, selecting OFF, VIDEO and PICTURE will not upload files.)
Ethernet	Supports manually setting of the device's IP, mask code, gateway, and other parameters. When connecting the device through a network cable, you can directly enter "http://IP" on the PC web page. IP refers to the actual IP address of the device, for example, you can enter http://192.168.66.116 to access the corresponding web page. You can also connect to the RTSP network stream via IP. For details about RTSP network stream, see Section 8.6.
Wi-Fi	Set the device's address, SSID and password. It takes effect immediately once setting.

d. System Configuration

Storage Control	Controls whether to enable the SD card storage and whether to enable the alarm when the SD card is removed or inserted.
Loop Overwrite	When selected, the circular recording function is enabled. It is enabled by default.
Normal	Normal video Settings, select the type of normal video, can select OFF (off), ON_CON (continuous video recording, will not be interrupted), ON_DIS (intermittent video recording, can be interrupted by alarm video).
Warning	Alarm recording Settings, select the recording format of the alarm, choose OFF (off), VIDEO (only video), PICTURE (only picture), VIDEO&PICTURE (video & picture).
Limit Rec Filelen_(min)	Set the maximum recording duration for a normal video. The value can be 5 minutes, 10 minutes, or 15 minutes.
File Type	Select video recording format, AVI & MP4 supported.
GPS Time Configuration	When selecting GPS time, the device will synchronize time according to the time zone when it starts. (GPS device, when the signal is good)

NTP Time Configuration	When selecting NTP Enable, the device date and time will be synchronized according to those on the NTP server. After setting the NTP synchronization interval, for example, 30 minutes, the device will synchronize itself with the NTP time when it is started, and every 30 minutes after that. (Note that there might sometimes be conflict between NTP synchronization Time and GPS startup time)
CAN	Set the related ID of CAN transmission 、 Frame format type and the baud rate of CAN transmission.

4. System Function

Click the "System" button on the main interface to enter. The System page displays the: Serial Number, Software Version, Hardware Version, Universal Unique Identifier (UUID) of the device see Right.

Upgrade	You can push the local upgrade package through the browser to upgrade the device. You can drag the upgrade package or click to select the upgrade package.
Import Config	To import configuration files.
Export Config	To export configuration files.
Export Log	To export device log files.
Restore Factory	Restore the device to factory settings, all parameters restored to default values.
Reboot	To reboot the device.
Change Password	Change the device login password (The default password is empty).
Device Time	Synchronize the device time manually.

5. Server Function

Refer to section 8.3 Network Configuration for the server parameter configuration. For on-line connection to the CMS use 4G, LAN & Wi-Fi.

- **4G -** Only if the device supports 4G. Set "Server Network Type" to 4G, enter the APN, user name, and password (as determined by the local carrier). After the server login function is enabled, you can connect to the CMS of the corresponding server to view real-time streams and device information.

- **LAN mode**

Set "Server Network Type" to LAN, both dynamic and static IP addresses are supported.

1) **Dynamic IP**

   If DHCP server is available on a networking LAN, able to select DHCP option. The device will be assigned a networking IP. After the server login function is enabled, you can connect to the CMS of the corresponding server to view real-time streams and device information.

2) **Static IP**

   Enter the network IP address, subnet mask, and gateway in the Ethernet configuration. After the server login function is enabled, you can connect to the CMS of the corresponding server to view real-time streams and device information. （Only static IPs that can be connected to the Internet can be brought online on the CMS）.
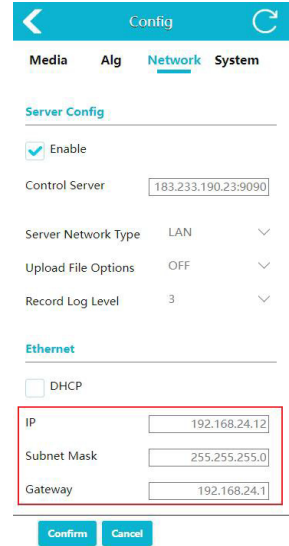
- **Wi-Fi mode**

Via an Internet-enabled Wi-Fi the CMS (connected to a corresponding server can view the real-time stream and device information.

   Step 1: Select "Enable" (On by default) in "Network Configuration" and select "Server Network Type" as Wi-Fi.

   Step 2: Slide down the webpage to see the related configuration items of Wi-Fi.

   Step 3: "STA SSID" and "STA Password" data items are filled with the name and password of the internet-enabled Wi-Fi. The related information can be viewed by connecting the CMS server through the Wi-Fi that can be connected to the network.

To view the online status of the device, you can return to the "Preview page" and click "Query Function" and "Status Query" to view STA information and server login status in the CMS server data.
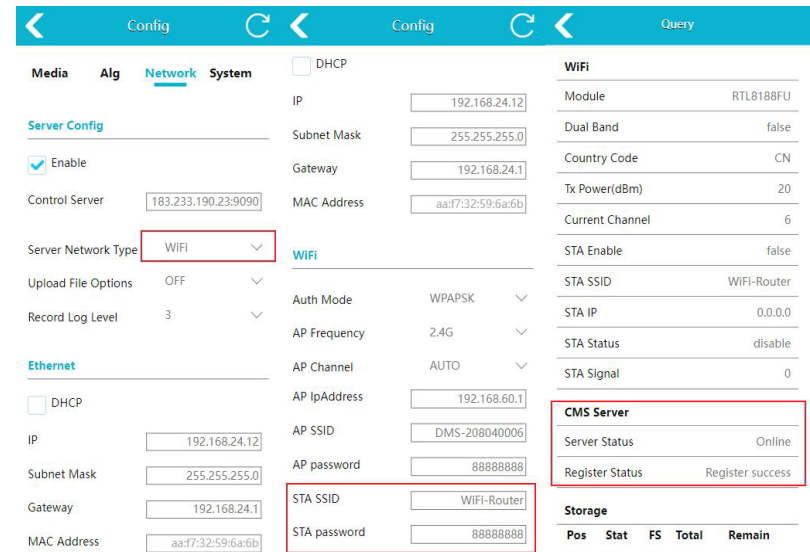
6. Protocol

The device supports two types of protocols, RTSP and ONVIF. Note: When using a network cable, the computer needs to be configured with the same network address format as the device.

- **RTSP -** Use video software to open RTSP stream. E.g. VLC: Connect the network cable and open the VLC, click Media->Open Network Streaming ->input "rtsp://IP/live/mainstream",The "IP" refers to the IP address of the actual equipment, such as rtsp: / / 192.168.66.116 / live/ mainstream(rtsp://192.168.60.1/live/mainstream if connecting to device's Wi-Fi)->click Play.
  - Use video software to open MP4 or AVI video playback.Take VLC as an example: connect the network cable and open the VLC, click Media->Open Network Streaming -> input "rtsp://IP/playback?file=file Path"->click Play. (The "IP" refers to the IP address of the actual equipment and file Path indicates the path of the video file in the Micro SD card. Currently, U disk recording is not supported.)

Enter the address for example:

① Alarm Video(MP4):
rtsp://192.168.66.116/playback?file=alarm/YYMMDD/HH/MM/xxxx.mp4
② Normal Video(MP4):
rtsp://192.168.66.116/playback?file=normal/YYMMDD/HH/MM/xxxx.mp4
③ Alarm Video(AVI):
rtsp://192.168.66.116/playback?file=alarm/YYMMDD/HH/MM/xxxx.avi
④ Normal Video(AVI):
rtsp://192.168.66.116/playback?file=normal/YYMMDD/HH/MM/xxxx.avi
(If the connection is device Wi-Fi, input "rtsp://AP IP/playback?file=file Path". The AP IP address is 192.168.60.1 by default. The AP IP address can be changed in network configuration.
For example:
rtsp://192.168.60.1/playback?file=alarm/YYMMDD/HH/MM/xxxx.mp4, other address format are the same as above)
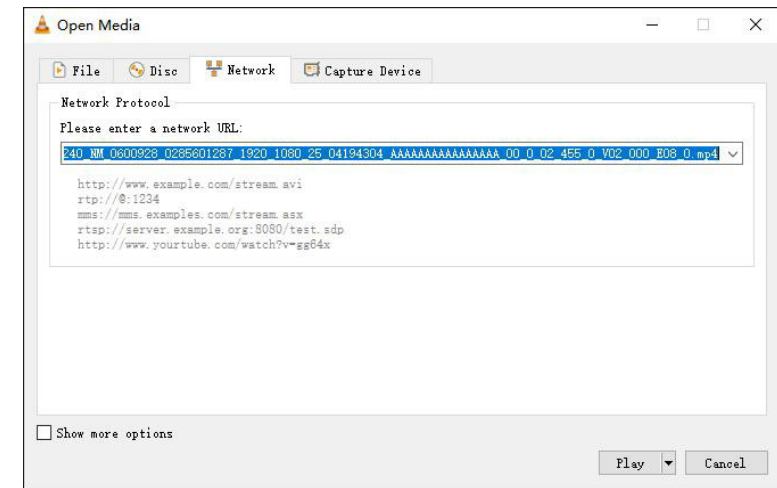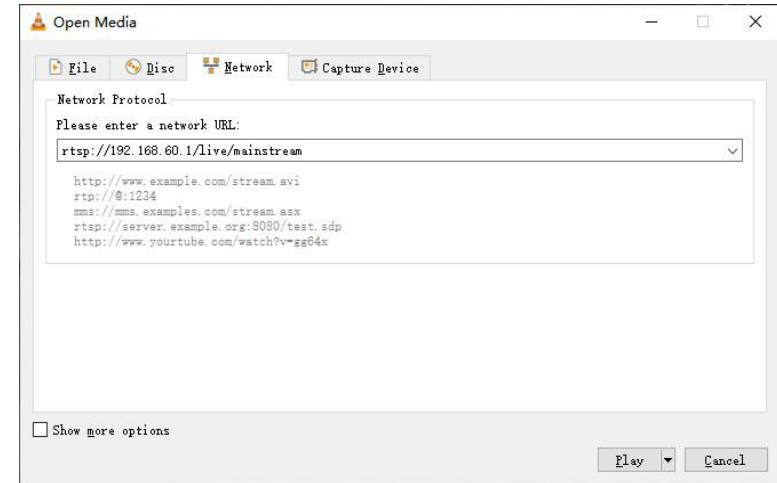
- **ONVIF –** Use the IP Camera Viewer or other software that supports the ONVIF protocol. Followings take IP Camera Viewer as an example.
Ensure that the network has been connected, and follow steps in Figure 40: add new camera->input ipaddr ->test ipaddr-> OK. The Port number is 80 by default.
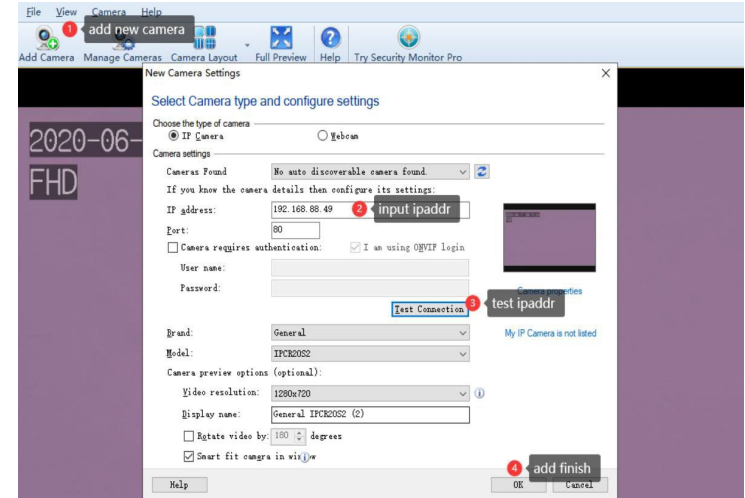
9. CMS Client Function

a. VIEW information

i. Real-time data

1. Real-time image

Click the device with online status (green), and right-click Open or Close the real-time stream.

These four buttons ▪ ▦ ▦ ▦ can switch the number of channels to be viewed at the same time, and the default is the nine-split button.

To view real-time images of multiple devices at the same time, double-click or right-click "open"on multiple online devices. Multiple real-time images will be displayed in the video window. In the case of multi-segment video window, you can drag the channel display order by the mouse.

To zoom in and view the real-time image of a channel, click a split button or double click a channel under the multi-split screen.
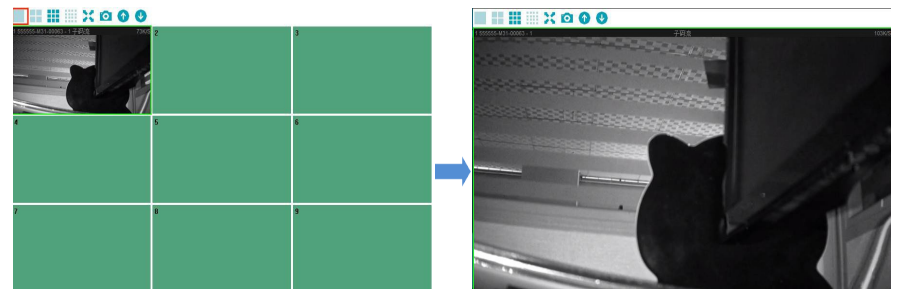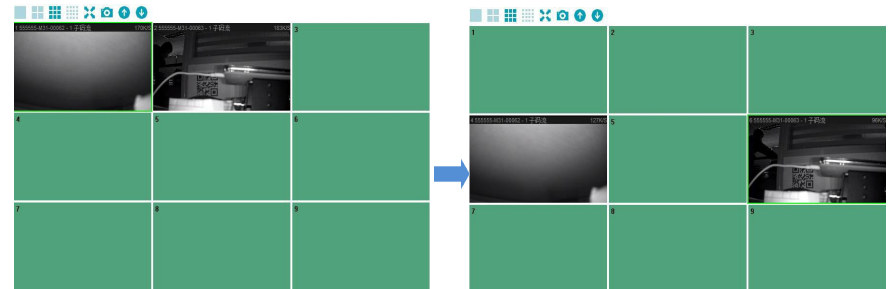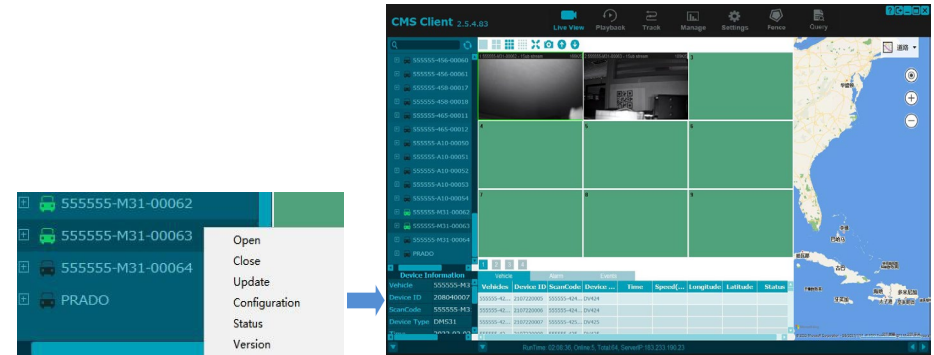
2. Real-time alarm

When the device is online with CMS (green) and the driver triggers the alarm, an alarm window will pop up at the lower right corner of the computer display screen. If the alarm window is configured to close on the CMS, the alarm window is not displayed. For example, in CMS->Settings-> Alarm Configuration ->Alarm Type, select Leave, and select Close in the alarm window. When the device triggers the alarm without driver (leave), the alarm window without driver (leave) will not pop up in the lower right corner of the display.
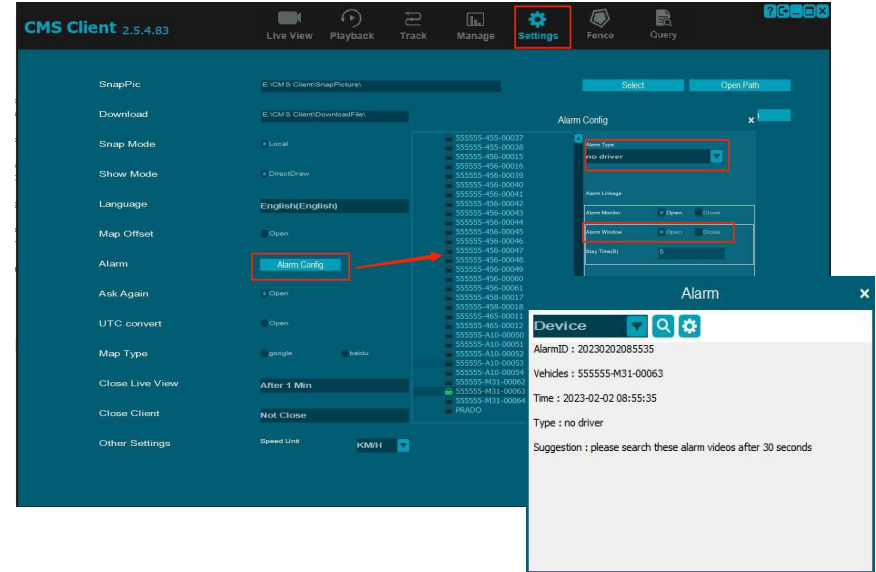
3. Real-time information

Vehicle： Different vehicles and their positioning information can be viewed.

Alarm： Alarm information of different vehicle equipment can be viewed.

Event： Events of different vehicles can be viewed (such as information about equipment online and offline).

ii. Video view

There are two occasions when alarm only VIDEO is uploaded:

1st When the device is online and there are videos or photos in the Micro SD card that have not been uploaded;

2nd When the parameter configuration, network configuration and file upload option of the webpage are set to VIDEO.

When "Upload File Option" is set to PICTURE, only alarm pictures will be uploaded. When "Upload File Option" is set to OFF, video and picture files will not be uploaded.

Step 1：Click "Playback" to select the required equipment, and the information on the calendar will be updated accordingly, with a blue mark indicating that there is a video to watch back on this date.

Step 2：Select the required date and time and click the "Search" button.

Step 3： To view the playback video, right-click the Start Download button.

Step 4：For downloaded videos, right-click "Open Path" or "Play vedio" to view playback.
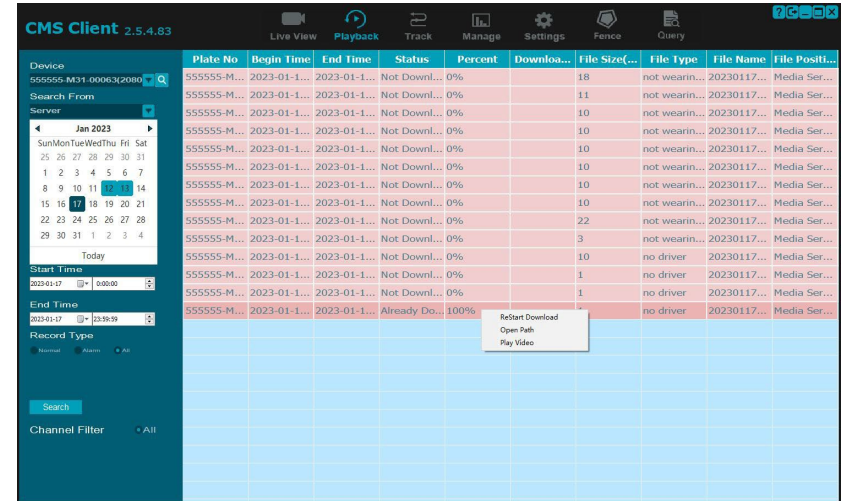
iii. **Track view**
When the equipment is online and the GPS is normal, users can view the running Track of the vehciles on the CMS client "Track".
Step 1：Click "Track" to select the required device, and the information on the calendar will be updated accordingly. Blue marks indicate that there are tracks available for viewing on this date
Step 2： Click the "Search" button and the track will play automatically

Step 3：Pull the playback speed progress bar to adjust the speed of the playback track, and pause/start the playback track at any time.
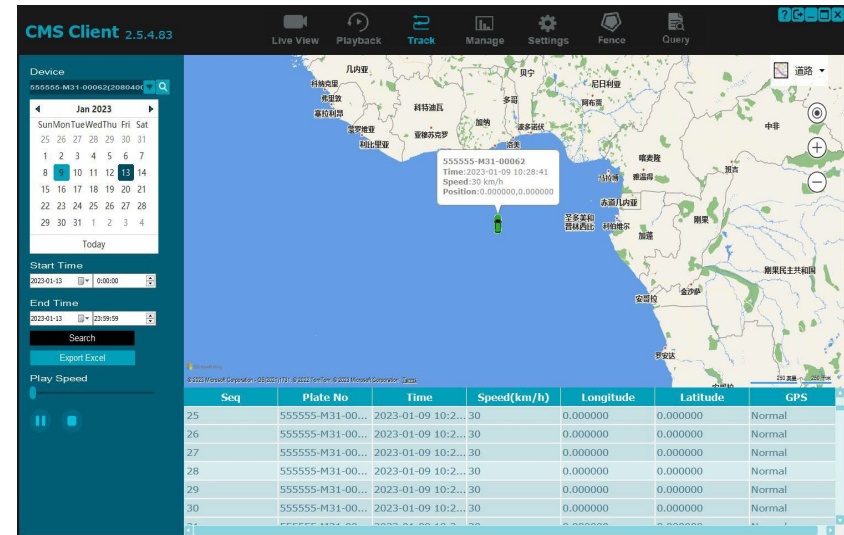
b. Parameter configuration

Select the online (green) device, right-click and click "Configuration" to open the configuration parameter page, where users can modify the parameters of the device, and the parameters of the device will also be modified   accordingly.
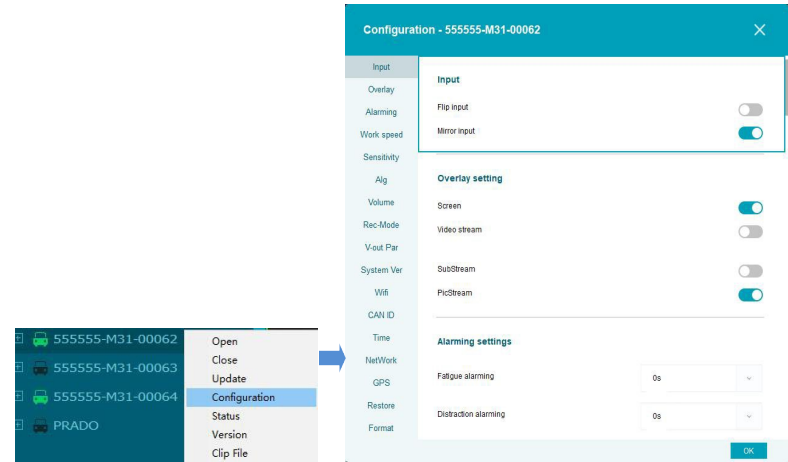
10. Upgrade

The device version is updated in 4-ways: Local upgrade, Web page online upgrade, Online upgrade and Offline upgrade. These four methods all need to use the Micro SD card to store the upgrade package, and the local upgrade can also use the USB disk to store the upgrade package. Note that Micro SD card and USB flash drive only support FAT32 format.

a. Local upgrade

Option 1： Put the update package onto the Micro SD card, then put the Micro SD card into the device card slot and restart the device.

Option 2： Put the update package into the USB flash drive, then insert the USB flash drive into the USB port on the device and restart the device.

If the update package format is DMS31V2_upgrade_XXXXXXXX.XXXX, the update package in the Micro SD card will be deleted after the upgrading.
If the update package format is MS31V2_upgrade_XXXXXXXX.XXXX_fixed, it will not be deleted. And it will still be stored in the SD card and can be used for upgrading in batches. Both are the same update package, just rename it as needed.

b. Web page online upgrade

Put the Micro SD card into the device card slot and enter the webpage through the network cable or device hotspot.

Step 1 : After logging onto the webpage, enter the "System" configuration page, click the "Add File" button to upload the upgrade package file or drag the upgrade package file to the designated area.

Step 2 : Wait for the upgrade package to be transmitted, and the device will automatically restart after the transmission.

c. Remote online upgrade

DMS connects to the server through 4G/LAN/Wi-Fi, open the Windows client, and logs in.

Step 1: Find the online DMS, right-click, and select "Update" to open the batch upgrading interface. If you need to upgrade multiple devices, you can click the "Add" button to select other devices. The selected ones will be displayed in the device list for upgrading. If you want to delete devices from the list, select them and click the "Del" button.

Step 2: Select the device to be upgraded, click the "Browser" button, and select the upgrade package "DMS31V2_upgrade_XXXXXXXX.XXXX".

Step 3: Click the "Start" button to upload the upgrade package. After the upload is complete, the device will automatically start to upgrade. If the upload fails, the reason for the failure will be displayed in the remark column of the list.

d. Remote offline upgrading

Step 1: Click "Manage"->"Offline Upgrade"->"Update Information", Click Add File to pop up the transfer file window.

Step 2: Upload the upgrade package to the client, adapt it to the server-side package name requirements, and name the update package in the format as dsm31_upgrade_xxxxxxxx..xxxx.

Step 3: Only after DMS is online, the system can automatically download the upgrade package and support resumable uploading.

11. Troubleshooting

The following problems are not necessarily caused by equipment damage. When encountering similar situations, please check according to the following instructions and contact customer service for repair if the problem cannot be solved.

Problems	Possible Causes/Solutions
No picture, no sound	Improper connection of device; It is likely an issue with the power supply, ensure the device indicator is normal; The volume is set to "0" by the mobile phone.
Unable to log in to the webpage	Check if the device is continually connected to the Wi-Fi network and a prompt box is displayed asking you whether to continue the connection. Select Yes.

Specifications

SHC-20280C/I

VIDEO	
Imaging Device	1/2.9" Colour CMOS Sensor
Resolution	2MP 1080P
Min. Illumination	Colour: 0.01 Lux @ F1.2 / Monochrome 0.0Lux
IR LEDs	6 x 940nm, 3m Illumination
Video Output	1 V pk-pk 75Ω
Frame Rate	25fps (PAL)/30fps (NTSC)
Gain	Auto
White Balance	Auto
BLC	Yes
Wide Dynamic Range	120db
S/N Ratio	>50db (AGC off)
LENS	
Focal Length	2.8 mm
Field of View (H x V)	108° (H) x 56° (H)
Lens / Mount Type	Fixed Iris / Board-in type
ALARM SETTINGS	
Audible alarm	Internal 3W speaker, Output, external speaker supported
Audible volume	Level 0 - 5
Alarm Output	1 external output, Sd Card recording (Max 128GB), Wi-Fi/GPS alarm out to local monitor, CMS + Mobile App
Detection	Facial Recognition (max 400 faces), fatigue, smoking (abnormal behaviour), phone use, distraction
Detection range	0.5 – 12m
Detection Zones	Adjustable colour zones (image overlay, red, yellow, green)
Audible alarm	Output, external speaker supported, 6 optional tones
COMMUNICATION	
Wi-Fi Module	Option
GPS Module	Option
Mobile App	LAN communication via ONVIF Protocol
ENVIRONMENTAL	
Operating Temp/ Hum	-20°C ~ +70°C /10-95% RH
Storage Temp/Hum	-40°C ~ +85°C /10-95% RH
Vibration Resistant	5.9G (ISO 16750.3)
ELECTRICAL	
Power	10 - 32V DC, 5W
Power & Video Connector Type	2 x 4PIN Aviation options cable 50cm
MECHANICAL	
Colour / Material	Black, Metal
Dimensions (W x H)	110*86.5*64 mm
Weight	200g
CERTIFICATION	
	CE/UKCA

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